THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. LXXVI. NEW YORK, SATURDAY, JANUARY 6, 1900. NO. 1.

ORIGINAL ARTICLES.

THE PRINCIPLES OF THE TREATMENT OF FRACTURES BY SYSTEMATIC MOVEMENTS AND MASSAGE WITHOUT APPARATUS FOR IMMOBILIZATION.[1]

BY DR. LUCAS-CHAMPIONNIERE,

OF PARIS, FRANCE;

SURGEON TO THE HOTEL DIEU AND TO THE HOSPITAL BEAUJON IN PARIS, AND MEMBER OF THE ACADEMY OF MEDICINE.

AS FAR back as the history of surgery is sufficiently detailed to give us any reliable information in the matter, we find that the treatment of fractures has always been regulated by the principle that immobilization of the fractured portions of bone should be promptly adopted and continued until repair was complete. In our own century this practise has been brought to perfection at least in the eyes of its advocates, and by the introduction of immovable apparatus.

The necessity for the immobilization of fractured bones has ruled surgery as a dogma admitting no doubt. The more perfect the immobilization the more rapid and more certain was the repair of the fracture considered, and the better was the surgeon's work performed. In principle and in practise, however, this system of immobilization is false and hurtful. Organs of movement were made to be moved; their health and their regular nutrition demand movement. The absolute suppression of it such as is attempted in complete immobilization lowers the health of these organs and interferes seriously with the processes of repair.

It is now a long while since I first took up seriously the study of a number of facts which indicated that the rapid and perfect repair of certain types of fractures could be best accomplished without immobilization of any kind. My first observation on this subject was made in 1867. Since then I have published a series of papers[2] and have read a number of articles before various medical congresses and societies on the treatment of articular fractures; that is, fractures into joints by immediate passive movements instituted at the very beginning of the treatment.

In 1894 I formulated and began to teach a complete method of massage and systematic passive movements in the treatment of recent fractures. I published a first memoir in June, 1886, laying down the principles and expounding the practise of a method which was the result of a large number of personal observations in the matter. In 1895 I published a volume of considerable size on the treatment of fractures by massage and passive movements. This work contained a number of photographs in order to facilitate the study of the practical problems involved in the new method of treatment.

As my experience has grown wider I have seen better and better results from the treatment. In my service at present in the Hotel Dieu, as well as in the Hospital Beaujon, there are always a large number of fractures under treatment, and this method is always employed with results that leave nothing to be desired. Large numbers of practitioners in France and in foreign countries have accepted the new method favorably, although, of course, as might be expected, the great majority of surgeons have strenuously opposed it, as it was completely contradictory to the hitherto formulated principles of treatment of fractures. One of the surgeons who has best grasped the extreme importance of this method is Dr. Caldwell, an American, who has recently published a paper embodying certain practical points which he gathered in my service here in Paris.

It would be hard to exaggerate the importance of this revolution in the art of treating fractures, as it involves at least one-fifth of all the cases of fracture which, in the ordinary course of his practise, come to the surgeon for treatment.

Moderate movement favors the repair of fragments of a bone. Where movement is permitted the callus will be greater in quantity, will be more solid, and will be more rapidly thrown out. Any large amount of movement would inhibit the process of repair, or at least seriously interfere with it. Moderate movement preserves the vitality of the limb and preserves the suppleness of the articulations, the muscles, and the tendons. It entirely prevents the occurrence of any muscular atrophy. In every case, therefore, in which moderate movement does not threaten to cause the occurrence of deformity the limb should not be immobilized. On the contrary, an attempt should be made to keep up passively if not actively the movements that are necessary to the vitality of the parts.

In addition to this passive movement, massage, which especially favors the repair of traumatic lesions of muscles, tendons, ligaments, and articulations, may always be applied in practise on the single condition that the parts involved in the fracture do not thus become the subject of untimely interference with repair. We may apply massage to fractures immediately after an accident on condition that this massage be of the special kind that can be performed while the fractured member is properly supported. Massage, if undertaken in the ordinary manner, or if administered too energetically, would certainly result

[1] Translated.

[2] Société de Chirurgie, 1879-1880.

lamentably. The massage for a fracture ought to be applied to all parts of the limb, along the muscles, over the ligaments, and upon the hemorrhagic effusions, but never just over the site of the fracture nor directly upon the fractured ends of the bones. The massage ought to consist of gentle, repeated pressure always in the same direction from the periphery of the limb toward the trunk. It should be sufficiently prolonged. The length of the time spent at massage will depend somewhat upon the character of the lesion and the sensitiveness of the patient, but at least a quarter of an hour to twenty minutes once a day should be devoted to it.

The massage should never give pain. It should always be followed by an attempt at passive movements of the joints of the limb, which procedure must also be accomplished without pain.

The first effect of massage should always be to cause anesthesia of the part, so that all pain that has existed previously should disappear after its employment. The massage causes rapid resorption of all exudations and especially of hemorrhagic effusions. It preserves the suppleness of the part and prevents muscular atrophy. It exercises without doubt a most favorable and deep-seated action upon the nutrition of the limb, preserves its vitality, and keeps its functions in readiness for service instead of permitting them to degenerate by disuse.

When a member has been massaged and passive movement has been practised for the treatment of a fracture, the repair of the break is much more rapid than if apparatus for absolute immobilization were used. The deformity is much less marked because from the very beginning the muscular contraction, which is so powerful an agent in the production of these deformities, has been made to disappear. Finally, the member which has always remained supple, which has suffered no interference with its articulations, and no atrophy of its muscles, is not only more quickly, but completely cured, by the treatment. On the other hand, after the application of apparatus, especially of irremovable apparatus, a long period must elapse in order to complete the cure, and a second treatment by passive movement must be undertaken to overcome the consolidating action which the apparatus has produced.

These principles of treatment should be applied to all fractures. There is only one contraindication. If deformity threatens to result, that and that only should prevent the surgeon from using this method or hamper him in its application. We can treat absolutely without any apparatus by massage and mobilization alone the large majority of the fractures of the wrists, of the radius, and Colles' fractures. The larger number of fractures of the clavicle are amenable to the same method. In four years at the Hospital Beaujon I have had in my service more than sixty cases of fractures of the clavicle. I have treated all of them without apparatus, using only a simple sling, and not once having had occasion to apply any other form of treatment. All the fractures of the upper extremity of the humerus as far down as the insertion of the deltoid may be treated in this same way. All the fractures of the lower extremity of the humerus, all the fractures of the elbow, including those of the olecranon, most of the fractures of the fibula, a large number of the fractures of both malleoli, many of the fractures of the knee, and all of the fractures of the scapula are best treated in this way.

Besides these many of the fractures which cannot be treated with absolutely no immobilization yield better results when treated by a mixed method. The apparatus should be used after a preliminary massage and removed from time to time in order to permit of further massage. Even in fractures of the femur and of the humerus one can apply this mixed method in a large number of cases. By this means we can lessen and in a large measure do away with the inconveniences connected with the use of fixed apparatus, some form of which may be indispensable. In a number of cases I have even practised massage in compound fractures as soon as cicatrization of the wound was complete.

The secondary treatment of members in which luxations have taken place should also consist of massage and passive movements, which have not only proved to be of invaluable service in such cases, but have never in my experience exposed the patient in the slightest degree to the danger of a recurrence of the dislocation.

A few statistics will give an idea of the importance of this method of treatment in my service. I must state, however, that during ten years at the Tenon Hospital and at the Hospital St. Louis I had the massage in these cases done by my pupils under my personal direction, but since 1894 I have had so many cases of this kind to treat and the work has become so important a feature of my hospital service that I have placed it entirely under the charge of a special assistant, Dr. Dagron, and have committed entirely to his care the training of a number of students as trained assistants for this work. This number has especially included not a few women in order to be able to provide properly for all the necessities for massage in a large hospital.

In the last four years, 78 male and female nurses have taken these courses and have been employed in the service, becoming expert general masseurs and masseuses, as well as acquiring practical experience in massage for fractures. About 1200 patients in all have been under treatment. In 598 of these patients the lesions treated were really serious, and the observations made on them have been collated with a good deal of care. Of the 598 patients, 370 suffered from fractures distributed as shown by the following table:

Fractures of the clavicle, 60; fractures of the humerus, 45; fractures of the radius, 110; fractures of the forearm, 17; fractures of the olecranon, 13; fractures of the scapula, 3; fractures of the femur, 5; fractures of the tibia, 29; fractures just above the malleoli, 7; fractures of the fibula, 50; fractures of both malleoli, 31.

The dislocations treated by immediate massage have reached the number of 78; the sprains treated by this method were 69.

Among the fractures enumerated a certain number of those in the middle portion of the leg and those of the femur have been treated by the application of apparatus for immobilization during the intervals as well as by massage; but the immense majority of them have been treated either absolutely without apparatus or by very simple methods of fixation, and with a total exclusion of every sort of irremovable apparatus.

We have, therefore, in this method of treating fractures by massage and systematic passive movements without apparatus, a mode of treatment completely formulated, thoroughly established in practise, and very general in its application. I have applied it in recent years in my large service at the Hotel Dieu just as I have done for so many years at the Hospital Beaujon and with just as satisfactory results.

This method undoubtedly gives more rapid and satisfactory results than any other method of treating fractures that have been employed up to the present day. It requires, however, much more attention and much more personal care on the part of the surgeon than the use of apparatus which after careful application may be left undisturbed for days or even weeks. This method requires daily inspection and the application of treatment by some one ready and able to give the condition careful attention.

The massage for these cases, applied according to the principles which experience has taught me to be of special value, presents no serious difficulty; but it must not be confounded with the more or less rough practises which are ordinarily designated by the name massage. *The complete suppression of all pain during the primary and secondary treatment of fractures is the capital point in the matter.* It is this that shows that it is being properly and efficaciously applied.

SOME OF THE CAUSES OF FAILURE TO RELIEVE ASTHENOPIA AND ALLIED SYMPTOMS.[1]

BY F. W. MARLOW, M.D., M.R.C.S., ENGLAND,
OF SYRACUSE, N. Y.;
PROFESSOR OF OPHTHALMOLOGY IN THE UNIVERSITY OF SYRACUSE, N. Y., OPHTHALMOLOGIST TO THE NEW YORK STATE INSTITUTION FOR THE FEEBLE-MINDED.

IT is by no means a rare thing for the ophthalmologist to meet with people who express the greatest disappointment, surprise, and sense of injury that a train of symptoms of years' duration, due, perhaps, to many complications, should not be relieved by the first glasses ordered.

Fifty years ago and less the matter of getting a pair of glasses was a much simpler affair than it is to-day, because at that period only the simpler errors were corrected. The subjects of asthenopia were advised long periods of rest, to adopt occupations not calling for close eye work, or were sent to the farm; while many, doubtless, became chronic neurasthenics.

To-day the causes of asthenopia are better understood, although in many directions our knowledge is very incomplete. Nevertheless, the recognition of the true nature of hypermetropia, the demonstration of astigmatism as a common error of refraction, and the establishment of the importance of latent deviations of the visual axes have greatly complicated the problem of fitting glasses, as well as widened the field of usefulness of the ophthalmologist.

If more people wear glasses than formerly, it is because the symptoms recognized to be due to eye-strain have greatly increased in number, and because of the demonstration of the importance of small errors, formerly neglected. With the increase in the complexity of the ocular problems presented for solution and in the number of those seeking relief from symptoms, there are necessarily more primary failures to relieve than was formerly the case.

Patients seek the advice of one oculist and if he fails to relieve them speedily, too often go to another. The second has to do the same work all over again, and, although he has the advantage of seeing the effect of the glasses prescribed by the first, is, perhaps, but little more successful.

The cases in which failure to relieve asthenopia occurs admit of fairly satisfactory classification on a clinical basis. They may be divided in the first place into two main classes; one consisting of *curable* cases, the other of *incurable* cases.

The curable cases may be divided into three groups. (1) In which the failure is the fault of the *patient.* (2) In which it may be said to be the fault of the *oculist.* (3) In which it may be said to be the fault of the *case,* or more specifically, due to the extreme latency of some of the errors of refraction and equilibrium.

The incurable cases may be placed under two headings. (1) Congenital asthenopes, people whose eyes are incapable of a normal amount of work, independently of their refraction and muscular condition, and of the general health. (2) Cases in which the symptoms are due to organic disease of the eye or brain, or to some general disease.

First, these incurable cases. There seem to be people who are born with eyes essentially weak; eyes in which no appreciable error of refraction or muscular equilibrium can be detected and in which nothing pathological can be discovered either by external or ophthalmoscopic examination, or eyes in which the apparently perfect correction of such errors as exist does not result in the desired relief; the general health of the patient being good. Such patients travel about from one oculist to another, seeking relief and finding none. The only credit which can be derived from the contact with these cases results from a realization and a frank statement of the situation, which, nevertheless, often requires a lapse of time and repeated examination for its appreciation. Cases

[1] Read by invitation before the Madison County, N. Y., Medical Society.

in which asthenopia is only partially relievable are quite common and require that the patient should adjust his activities and mode of life to the capacity of the eyes to work. The following is a good examples of this type:

March 27, 1897.—Mr. M., aged thirty-five, theological student, has been an athlete and an athletic trainer, in perfect general health. He complains that he can hardly read at all; that the muscles of his eyes ache; that his stomach troubles him if he does too much eye work. He had already consulted an oculist in some other city, who after using a mydriatic had given him weak convex spherical glasses. Examination showed his vision to be above the normal standard in each eye; that there was a low degree of hypermetropia, which was accurately corrected by the glasses already prescribed; that the muscular equilibrium was normal. Testing the power of adduction and abduction showed the latter to be relatively fuller than the former, and this afforded the only therapeutic indication in the case. He was prescribed prismatic exercise. Five days later when he came back the adduction was of normal measurement, but his condition was worse. He could not read as long. I saw him again about a month later. In the interval he had seen a well-known New York ophthalmologist who, recognizing the same relative weakness of the adduction, had given him prisms to wear during reading, but without benefit. Examination showed no change in any particular. I told the patient, therefore, that he must adjust himself to the situation; that lapse of time and prolonged rest would do for him all that could be done, at any rate, for the present.

I will not do more than refer to the groups of cases in which asthenopic symptoms are due to organic diseases of the eye, brain, or disturbance of general health. The true nature of such cases sooner or later becomes apparent.

We now come to the class of curable cases in which failure to relieve symptoms occurs for one of the reasons already given. In the first place, it may be the fault of the patient. There are many ways in which patients fail to carry out the directions given to them. Three errors stand out a little more prominently than the rest.

They neglect to wear their glasses constantly. This is a very common cause of failure. Patients also who have been already prescribed for with sufficient accuracy for reading, not infrequently seek advice because they still have symptoms referable to eye-strain, and in many of these cases all that is necessary is to advise the constant wearing of glasses already prescribed. Failure from this cause is sometimes the fault of the advisor as well as of the patient. The wearing of glasses to correct any, even the smallest error of refraction, changes entirely the previous working methods of the eyes, their accommodation, the relation of accommodation to conveyance, the relative tension of the extrinsic muscles, distribution of innervation, etc., and it cannot be regarded as surprising that some discomforts should occur at first. There is, indeed, a period of adaptation during which the new method of working is established. If the glasses are removed and the eyes are used without them they resume their old habits, which again are disturbed when the glasses are replaced. In some cases, indeed, there is not only a failure to relieve but even an aggravation of the symptoms from irregularity in the use of glasses. Such cases require no further comment.

There are other cases in which the patient wears his glasses constantly, but the period of adaptation is so prolonged and the discomforts attending the commencement of wearing glasses are so persistent that he not unnaturally comes to the conclusion that they must be incorrect. This is, of course, sometimes the true explanation of discomfort. There are, however, many cases in which perfectly corrected glasses give rise to prolonged annoyance and yet are finally worn with perfect comfort and ease. The following is a case in point.

Miss A. B., aged thirty, came for advice on March 31, 1891. Her eyes had troubled her since the age of two years when she suffered from sore lids; eyes always weak; as a girl was more out of school than in, on this account. For the past two years has suffered much from headache which has been a great deal worse lately. Has worn glasses eleven years. Until three years ago had worn smoked glasses, the chief trouble being photophobia, frequent inflammation of eyes and lids, and nausea. Since then she has worn a weak astigmatic glass 0.50c. 90° in each eye. Examination R. 6/9+0.75s.+0.75c. improves. L. 6/6 Hm. 1.D. After atropin she accepted R. +2D¹s.+1c. ax. 80°=6/6. L.+2.25Ds.+D.25c. ax. 150°=6/6, and was prescribed R.+1.75.+1c. 80°. L.+2D.s+0.25c. 150° for constant wear.

April 22.—She came back complaining of more headache, stating that sewing produced almost immediate pain in the eyes and lacrimation. Examination gave essentially the same result. Continued use of the glasses was insisted on. She left my office much discouraged, and I saw her no more until I accidentally met her in the summer of 1896. She then informed me that she gradually became comfortable with the glasses, which had entirely relieved her symptoms, and that she was wearing the same still.

This case is also an example of failure due to the omission to use a mydriatic; thus leaving the latent error unrecognized and uncorrected, to which reference will be made later.

Occasionally too much near work is attempted by those who, after suffering from asthenopia for years, have just had their refractive and other errors corrected. In many cases the resumption of work should be quite gradual.

Failure may be the fault of the oculist. I do not refer to the grosser errors which should be avoided by any well-trained and careful man, but to certain matters about which there still remains some difference of opinion in the profession. For

instance, he may neglect to correct low degrees of astigmatism, or, what amounts to the same thing, may fail to correct astigmatism with sufficient accuracy. Personally, I regard it as thoroughly established that low degrees of refractive error, especially astigmatism, are very effective in certain kinds of people in producing asthenopic disturbances.

In one of the well-known text-books we find the statement that "it is not usually necessary to correct astigmatism of less than one diopter." There are, doubtless, many persons in whom this amount of error seems to produce no discomfort, but in those who complain of asthenopic symptoms it is certainly a mistake to omit the correction of any plainly demonstrable astigmatism down to 0.25D, and it must be remembered that only those who have symptoms go to a physician.

A case I had some years ago impressed this fact very strongly upon my mind because the patient had during the ten years previous to consulting me been under the care of some of the most competent ophthalmologists in the country who had uniformly failed to benefit her. I ought to state that at that time the efficacy of low degrees of astigmatism to cause trouble was by no means so well appreciated as it is now.

March, 1889.—Mrs. J. P. D., aged fifty years; ten years ago began to suffer pain over the eyes and through the head after the use of the eyes. Suffers much from nervousness and insomnia. Cannot even look at distant objects without trouble. Headache twice a week. Sometimes has to go to bed on account of it. Examination showed one-quarter of a diopter of astigmatism in each eye; nothing else. I prescribed glasses correcting it for distance, and introduced the same correction for astigmatism into her reading glasses. The result was a practical cure. Three and a half years later she was able to use her eyes for two or three hours at a time for near work and headache occurred seldom.

The oculist may err in failing to correct the latent hypermetropia or in over-correcting myopia. These errors have been common in the past and are liable to continue to be so, for on the whole, there seems to be a tendency to attempt to dispense with a mydriatic, which at present is the most reliable means of demonstrating latent errors, on account of the annoyance to the patient, and of the difficulty which is occasionally experienced in getting used to glasses prescribed, perhaps injudiciously, after such preparation. While it is perfectly true that the attempt to wear a full correction of the refractive errors is often accompanied by annoying and discouraging symptoms, these symptoms are usually quite short in duration. It is equally true that the symptoms from which the patient seeks relief cannot be permanently removed without a correction of the latent as well as the manifest error.

The second case reported was a very good example of this fact. I am convinced that she could not have been relieved had the latent hypermetropia been left uncorrected. I do not mean to contend that a full correction of the latent error should be made in *every* case where we prescribe glasses. There are many cases in which symptoms are slight, and especially where patients will not wear their glasses constantly, in which a partial correction, at any rate, for a time, better meets the indications of the case. A perhaps more excusable cause of failure is the neglect to take into consideration the influence of latent strabismus. In many cases of asthenopia we find in addition to errors of refraction a tendency for the visual lines to converge, diverge, or deviate one above the other. Sometimes, some say as a general rule, the deviating tendencies are secondary to the refractive errors and disappear when the latter are corrected. But there are many cases in which the correction of these errors, however accurate, not only fails to relieve the symptoms but even aggravates them. It is easy to see how this may be the case. With the refraction corrected the retinal images are in greater or less degree indistinct, so that a more or less imperfect super-position of them is easily tolerated. But when the refraction is made accurate, clearly defined images are formed on the retinæ and an exact and constant correspondence of them is necessary or diplopia results. This increases the work, already excessive, of some of the muscles, and discomfort expressed in one way or another results.

I am referring now only to cases in which a sufficient latent deviation is detected before the first glasses are prescribed.

A case in point is that of Miss M. V., aged nineteen years, first seen May 18, 1891, who complained of pain on use of her eyes. Headache daily. She disclosed, on examination, before and after use of mydriatic, a moderate amount of Hy. with astigmatism and 12° of esophoria or more. As it seemed probable that the convergence was secondary in part, if not altogether, to the Hy. astigmatism, she was ordered simply the glasses for refractive error. They aggravated the symptoms. On June 15th she came with smoked glasses, having severe photophobia, entirely unable to read, etc. She showed a convergence of 21°. She was at once given prisms 3° each, bases out, which gave her immediate relief. To cut a long story short, the error was finally corrected by tenotomies, which gave complete and apparently permanent relief.

I have done little more than refer to the preceding groups of incurable and easily curable cases for various reasons. The latter groups require more persistence on the part of the patient or more careful attention to the demonstrable facts of the case on the part of the ophthalmologist. More than one prescription may be necessary before the glasses which give the greatest degree of relief can be decided upon.

The last group of cases is by far the most important, at the same time one of the most interesting to the physician, and at first most discouraging to the patient. The symptoms present are evidently due to the eye-strain, and yet after care-

ful and detailed examination of eyes, refraction, muscular equilibrium, etc., either nothing can be found wrong, or, after all errors are accurately corrected and have been shown by repeated examination to be accurately corrected, the symptoms persist or are aggravated by the glasses prescribed. Neither glasses nor mydriatics aid much in the elucidation of these cases; one thing only brings about their final solution, and that is the lapse of time. This shows that they are cases either of latent hypermetropia, latent astigmatism, or latent heterophoria. The significance of this is very great. It amounts to saying that while it may be possible to determine positively the existence of certain errors at the first examination, we are not justified even when the first tests are absolutely negative in saying that no error exists or that no error in addition to what we have discovered exists. We can never say "this patient's eyes are perfectly free from refractive or muscular error," until the lapse of a considerable period of time, and repeated examinations have taken place. In fact there is good reason to think that old age is reached before the complete manifestation of these errors in some people.

It is a common idea that atropin and other mydriatics produce a complete paralysis of the ciliary muscle, and thus reveal all the latent refractive error. There are many exceptions. Atropin of the strength of 4 grains to the ounce used three times a day for several days at a time may yet leave hypermetropia unrevealed, as the future history of the case may show.

Thus: H. S., aged eleven years, in February, 1894, accepted for each eye +0.25s.+0.25c. R. axis 105°. L. axis 75°. After atropin had been used for three days testing gave R.+1s.+0.25c. ax. 100°. L. 1.25s. 0.25c.ax. 80°.

In April, 1896, after using atropin for five days R. accepted +1.25s.+0.37c. ax. 105°. L.+1.5s. and c.+0.25c. ax. 75°.

In December of the same year, after using atropin five days, R. accepted +1.75s. and c. L.+2s. and c.

Five days more of atropin did not change the result. Thus, in 1896 nearly twice as much Hy. could be demonstrated as was shown after atropin two and one-half years earlier.

What is true of latent hypermetropia is also true of some cases of astigmatism. Although less common, latent astigmatism is nevertheless a reality, and occasionally in spite of the use of the usual mydriatic years have to elapse before the manifestation of the total astigmatism takes place. Until this occurs the relief afforded is incomplete or transient, or both. I have seen many instances of this condition, and report the following as a striking instance:

W. B. D., aged sixteen years, first seen on October 9, 1890. Symptoms: rapid tiring of eyes in reading. Examination showed astigmatism, +0.5Dcyl.; axes 90° in each eye. A mydriatic (homatropin) was used, and disclosed in addition to the astigmatism, which remained unchanged, 0.5D of hypermetropia. Tests of the muscular equilibrium showed also a tendency to convergence, corrected by a prism of 5°. He was given a correction for the astigmatism and 1½° prisms for each eye, and remained comfortable until April, 1891, when his asthenopia returned. Examination showed no change in the amount of astigmatism but an increase in convergence, and the prisms were increased to 3° each. This gave him sufficient relief to prevent my seeing him for three years, when he returned with asthenopia after one hour's reading. The ophthalmometer had in the meantime come into general use and it showed in each of his eyes a corneal astigmatism of 2D at 90°. Homatropin was again used and he accepted a +1D cyl. in each eye, or double what he had previously chosen, the hypermetropia remaining the same. Convergence was now 12°. The glasses prescribed upon this basis gave him relief until January, 1895, when the left eye accepted +1.25 cyl. In July, 1895, the right eye took +1.25c. and the left +1.5c., the convergence amounting to 15°.

As the indications were that the latent convergence was causing some of the symptoms, and as it was increasing in degree in spite of the fuller correction of the refractive errors, in the following September I corrected it by partial tenotomies, reducing it from 15° to between 2° and 3°. In November+1.75D. cyl. corrected the astigmatism in each eye most accurately and was prescribed. He got on well until June, 1896, when there was some return of the asthenopia, due to the latent convergence remaining uncorrected; this finally amounted to 9° and was corrected in January, 1897, leaving perfect equilibrium. He now has no trouble at all.

In this case a lapse of five years occurred before the astigmatism became completely manifest. He is now wearing cylindrical glasses just three and one-half times as strong as those originally accepted.

Another group of cases of exceeding interest are those in which there exists a latent deviating tendency of the visual axes at first and often for a long period of time incapable of demonstration.

For instance, a patient complains of rapid tiring of the eyes in near work, or headache, or some such symptom, and we find or satisfy ourselves that there is no error of refraction, or that such errors as exist are accurately corrected; we then investigate as the next most probable source of trouble, the extrinsic muscular system. We annul the binocular function by one of the many methods at our command, and we find the visual axes parallel and, perhaps, also the adduction and abduction and sursumduction within the normal limits. There is no indication whatever of faults of equilibrium.

There is nothing to be done in such cases except to prescribe such glasses as are necessary to correct the errors of refraction, if any, and wait for future developments. In some cases the manifestation of deviation may be aided and hastened by the systematic measuring of the different

pairs of muscles and prescribing of prisms to relieve those that are relatively weak, but, as a rule, the *lapse of time*, and sometimes a considerable period of it, is the only element which will bring about a final solution of the problem.

I now wish to detail two or three of these cases and I do so without any apology, for they are not only of great importance in themselves, very suggestive in their bearing on cases we see and do not understand, but there is good reason for thinking that the frequency of their occurrence is not widely appreciated.

The first case is that of Mrs. C. E. L., aged thirty-eight years, who was examined first on May 15, 1891. She had always been a great sufferer from sick headache, occurring about twice a week, accompanied by fearful nausea and severe vomiting. Other members of her family were also subject to the same affection. She had no difficulty in using her eyes. Examination showed that there was a moderate degree of astigmatism in the R. eye +0.75D cyl.; axis 75°. L. + 0.25 cyl. 120° and latent divergence 4°. The cylinders were prescribed.

In January, 1892, she reported herself no better. The R. accepted the same, and the L. was very indefinite in the choice of cylinders; therefore, as there remained a low degree of divergence, a prism base in 1″ was substituted for the L. cylinder. March 30, 1893, she was unimproved, having, in fact, sick headache commonly two or three times a week, the longest interval having been five weeks. She now showed divergence 7° and a 3° prism was placed before the L. eye. One week later a deviation of the right eye 1° higher than the left was demonstrated. This was the first time, although she had been under observation already for two years, that any tendency to deviation in the vertical direction could be detected. A prism 1° base down was ordered for R. eye. Three weeks later she returned with the report that she had had much less headache; examination now disclosed R. hyperphoria 2°. On July 18th the error measured 4-5°. She had had one headache only in the preceding three months and less insomnia. In December, 1893, she was prescribed R. + 0.75c. 75° pr. 3½° base down. L. 0.25c. 130° pr. 3° base in.

In September, 1894, she reported an interval of three months without a headache, but within past four weeks three attacks had occurred. The vertical deviation now measured 7° and the lateral 6-7°. As this was too much for convenient correction by prisms, tenotomy was advised but not accepted. In June, 1895, she reported no headache for four months.

In May, 1891, no error could be detected in the vertical plane; three years later the R. eye could be demonstrated to tend upwards to an extent requiring a 7° pr. for the correction (*i. e.*, 3½° actual deviation).

When it is remembered that the ordinary power of independent vertical movement is from 2° to 3°, the magnitude of this error can be better appreciated. The persistent innervation necessary to maintain parallelism of the visual axes resulting on the one hand in a very fixed spasm of the muscles innervated, and on the other hand in a state of neurasthenia, expressing itself by the frequent explosions constituting sick-headache.

The second case, F. T., aged twenty-three years, was first seen in May, 1894. His symptoms were headache with confusion in the head after reading, and some intolerance of light. Examination disclosed some mixed astigmatism in the left eye, the ophthalmometer showing a much higher degree of astigmatism than the glasses he accepted. The muscular equilibrium was normal.

I prescribed for him three times within three months without giving him any relief except for one week after the first prescription. I was entirely unable to demonstrate any fault in the balance of the ocular muscles. After the third prescription he disappeared. He went the rounds of all the oculists in the neighborhood and being apparently unable to get out of the vicious circle he reappeared in my office on September 9, 1897. He reported that he was better without than with the last glasses prescribed by me; that in the interval he had been prescribed an indefinite number of pairs of glasses, etc., without relief. His chief symptom now was intense photophobia. Examination showed a little less astigmatism than at his earlier tests, and also what had never given any indication of its presence before, a latent deviation of the L. higher than the R. of ½°. His refraction was carefully worked out, both without and with a mydriatic, the result being that glasses not very different from those originally prescribed were ordered, with the addition of ½° prism to offset the deviation. Some relief was at once experienced and more deviating tendency soon manifesting itself, was corrected by prisms, until on October 2d he reported himself much more comfortable and able to be out on the shady side of the street without colored glasses, whereas, two weeks before he could scarcely look out of doors with colored glasses.

With a fuller correction he reported on October 13th that he was able to be out in the sunlight for a short time without colored glasses, and had, in fact, worn none for five days. The total deviating tendency now equaled 2° and was fully corrected in the glasses prescribed.

The last case I have to report was even more perplexing and complicated than any of the preceding. It was under observation a little over four years, and during this period of time changes of three different kinds occurred in the eyes.

At the end of this period four times as much astigmatism could be demonstrated as at the beginning. From a moderate degree of hypermetropia the eyes changed to condition of moderate myopia. Whereas in the first place but little latent deviation, and that convergence, was shown, four years later a very considerable upward and inward deviation could be demonstrated.

This patient was fourteen years of age when I first saw him in 1890, and complained of defective vision and aching. He had been prescribed

+0.25 cyl. by one of the best-known men of Detroit, which relieved him until he went to school. Examination showed that he had a low degree of Hy. astigmatism in each eye, fairly accurately corrected by the glasses already prescribed, and also a convergence of 8°. Prisms 1½° base out gave him more relief than the previous glasses. Five months later (March, 1891) he returned with more asthenopia and more astigmatism could be detected +0.5 cyl. each. No latent convergence was to be found. Indeed, the muscular balance had become perfect.

In September, 1891, symptoms returned, due to apparent increase of astigmatism, which was corrected. In April, 1892, the R. preferred a concave cylinder. In September, 1892, the R. showed less astigmatism than at either of the preceding visits.

Now, for the first time in one and one-half years a low degree of latent convergence could be detected, amounting to 2°. In April, 1893, he came back again with an increase of symptoms. On this date his eyes were examined with the ophthalmometer, which showed corneal astigmatism, R. 1.5D 90°. L. 1.75D 90°. He accepted stronger astigmatic glasses than before, the astigmatism being myopic in the right and mixed in the left eye. Esophoria, 1½-3°. A full correction of his astigmatism was prescribed. It aggravated his symptoms.

In August, 1893, no better; lacrimation, headache. Latent convergence of 4° could be demonstrated, and prisms 1½ each, correcting the greater part of this, relieved his symptoms. No hyperphoria. In January, 1894, return of symptoms, again relieved temporarily by correction of slight change in refraction. On July 17, 1894, tests showed the presence of a tendency of the right eye to deviate upward 1°. R. sursumduction, 2°. L. 1°. Let me emphasize the fact that he had been under observation more than three and one-half years before any hyperphoria could be detected. With the temporary use of a prism the deviation increased to 1½° and prisms correcting that error were introduced into his glasses. The final tests were made in December, 1894, on three or four consecutive days, and resulted in showing myopic astigmatism in both eyes, hyperphoria of 2°, and latent convergence of from 2° to 8°. The glasses ordered on this basis having given him practically complete relief. R.—0.75c. 170° pr. 2° base out-down pr. axis 40°. L.1c. +0.25s. pr. 2° base out-up pr. axis 40.

I have very little to add by way of comment to these cases. It seems to me that the facts they contain fully justify the statement made earlier in the paper that it is impossible at an early stage of investigation to disprove the existence of certain efficient causes of asthenopia and that time alone can be depended upon to solve the problem.

If I have succeeded in showing that, at any rate in some cases, legitimate excuses may be made for the ophthalmologist who fails to relieve asthenopia promptly, the object with which I prepared this paper has been attained.

LATENT INFECTION AND SUBINFECTION AND THE ETIOLOGY OF HEMOCHROMATOSIS AND PERNICIOUS ANEMIA.[1]

BY J. GEORGE ADAMI, A.M., M.D.,
OF MONTREAL;
PROFESSOR OF PATHOLOGY MCGILL UNIVERSITY.

FACTS are not of necessity truths; however sure we may be at a given moment of the facts upon which we base our conclusions and determine our treatment, those facts may not be the whole facts, those truths not the whole truths. Aseptic and antiseptic surgery, and our theories with regard to infection, have for years been based upon a fundamental postulate that the skin and the mucous surfaces of the body form a natural barrier beyond which, under normal conditions, bacteria do not pass; that the presence of bacteria in the deeper tissues is the exception and not the rule. While it would be absurd to deny that this postulate has been the most valuable, for without it modern medicine could not be in its present position, and while admitting that if not true it must be somewhere near the truth (otherwise facts and observations would not conform to it in so great a measure), is it the whole truth, does everything prove that, normally, the tissues are free from bacteria?

Studying more especially the digestive tract, the observations of Schæfer, Zawarykin, Heidenhain, and A. B. Macallum show that constantly, more especially during the digestive act, leucocytes containing various materials pass out into the lumen of the intestine and pass back again into the submucous tissues, into the lymphatics of the villi, and into the portal venules also present there. Among these, as shown very clearly by Ruffer's observations, are bacteria. If the small intestine of the healthy rabbit be taken immediately after death, sections being cut and stained by the ordinary methods, abundant leucocytes containing micro-organisms are found in the lymph-follicles of the Peyer's patches; the same is true also in connection with the tonsil. Bacteria so passing in tend to be destroyed and the lymph-glands in the subepithelial and submucous areas of the respiratory system may be regarded as a second line of defence of the organism against bacterial invasion.

But these facts show that at least one tissue, if not normally sterile, may be regarded as *potentially sterile;* the tendency is for entering bacteria to be rapidly destroyed, but it is possible to realize conditions under which this destruction is not adequate. We can, however, go beyond the submucous glands. Dr. A. G. Nicholls, Senior Demonstrator in Pathology at Magill University, has recently pointed out that if the mesentery and the small intestines of healthy rabbits be properly removed immediately after death and properly stained, the mesentery shows relatively abundant bacteria within it in various stages of disintegration. The same is true not only of the lymph-

[1] Abstract, made by the author, of an address delivered before the Society of Internal Medicine, Chicago, Nov. 29, 1889.

oid tissue but of the mesenteric glands. My own observations have carried this subject of the existence of bacteria in the healthy tissues a considerable step further. It has been repeatedly demonstrated that within a very few minutes after intravenous inoculation of bacteria (*e. g.*, anthrax and tubercle) these are taken up by the endothelial cells of various organs, more especially the liver. In the studies made by Drs. Adami, Abbott, and Nicholson, they found that taking the colon bacillus and inoculating this intravenously, within a quarter of an hour the endothelial cells of the liver showed abundant contained bacteria, which were undergoing degenerative changes. The long rods tended to break up into short pieces and in several cases all that could be seen of them were small diplococcoid-like bodies still staining strongly but absolutely unlike the original bacillary form which had been inoculated. At a still later period, in from two to four hours, an increased number of minute slightly brownish diplococcoid forms were made out actually within the liver-cells. The same process also occurred in the cells of the convoluted tubules. These bodies vary considerably in their size and are evidently in various stages of destruction and dissolution, and they can only be recognized by the higher powers of the microscope; the ordinary one-twelfth immersion is generally insufficient to demonstrate them properly. It was pointed out that these could only be the remains of the inoculated bacteria.

Long ago Cohnheim suggested that the body protects itself by excreting living germs through the liver and the kidney. The observations of Wyssokowitsch appear to definitely disprove this, and Sherrington came to similar conclusions altogether, although he pointed out that occasionally he found bacteria in the urine and bile without blood being present or any evidence of actual gross lesion in the tissues.

Among those who have confuted Wyssokowitsch's observations, the studies of Dr. Fütterer of Chicago are more especially noteworthy. This observer was able to find the bacillus prodigiosus in the pelvis of the kidney of a dog two minutes after injecting a culture into the jugular vein, and he obtained the same micro-organism and the pyococcus aureus from the common bile-duct within three minutes after he had inoculated them into the blood of the left side of the heart. He therefore concludes that certain bacteria at least are actually excreted as Cohnheim suggested. So also in personal experiments with the colon bacillus the minute and apparently dead diplococcoid forms in the bile have at times been found, but their very appearance indicated that they had been acted on during their transit through the liver. When the number is not too great the liver tissue is capable of wholly destroying and digesting bacteria circulating in the portal blood. Where, however, this function of the liver-cells becomes exhausted by the taking up of excessive numbers of the bacteria, then it is possible for these to be excreted in the bile in a still living state.

These observations appear to demonstrate clearly that while one of the functions of the lymphatic gland is to take up and destroy bacteria gaining an entrance into the lymph, a function of the liver, both as regards its endothelium and its cells, is to take up and destroy such bacteria as are introduced by leucocytes into the venules of the portal system, while similarly a function of the kidney parenchyma, more especially of the convoluted tabules, is to remove bacteria circulating in the systemic circulation.

Not only can these powers be shown experimentally, but in the liver-cells of normal animals, of man and of the rabbit for instance, the brownish diplococcoid bodies which would seem to represent not necessarily only the degenerated colon but it may be other bacterial forms are normally present, while inflammation of the intestines, judging from the great numbers present in sections of the liver after such, would seem to favor the passage of bacteria into the portal blood.

These views, it is true, appear to be diametrically opposed to the very numerous observations that have been made upon the bacteriology of the normal blood and of blood in cases of disease and in the bacteriology of normal tissue. While it was generally held that normal blood is absolutely sterile, the observations of Nocard, confirmed by Porchard and Désoubry show that, more especially after a meal, bacteria are present in the chyle and cultures may be obtained from the normal blood. These observations of Nocard have been given the lie direct by Max Neisser and others. Making cultures from the chyle, the lymphatic glands, etc., this last observer came to the conclution that the chyle is absolutely free from germs, as is also the normal blood. Recently Franklin Warren White of Boston, studying the blood in various diseases, obtained from 92 cases of active disease only 12 cultures from the blood; all of these were staphylococci, streptococci, and pneumococci. Warren White himself has in conformity with other observers shown that the blood-serum even of healthy individuals is not markedly germicidal for pus-organisms. In this lies the explanation of the whole matter. The observers who have most frequently gained positive results are those who have employed broth cultures and have diluted the blood considerably, whereas those who have worked by means of streak and plate cultures of solid media have gained positive results with forms which are relatively resistent to the germicidal action of the blood-serum. These observers have failed to take into account the strong bactericidal action of the shed blood; 1 c.c. of shed blood will kill thousands of anthrax bacilli, for example; a very much smaller number introduced into the total circulating blood of the rabbit will proliferate and cause the death of the animal; the bacterial powers of the circulating blood are relatively slight, whereas those of the shed blood are remarkably powerful. It is in the act of coagulation that the bactericidal substances are for the greater part liberated. There is little wonder, then, that in the observations of White,

Petruschky, Sittman, Neisser, etc., only those forms and just those forms relatively resistent to the bactericidal action of the blood-serum managed to proliferate and to form colonies. In short, the only method to determine the presence of bacteria in the circulation blood with any accuracy is one which until now has been little employed; it is that of diluting the blood with 100 or 200 parts, or more, of broth whereby the bactericidal substances are so diluted that bacteria may grow.

Similar considerations and similar criticisms may be brought to bear upon the observations which have been made with reference to the existence of bacteria in the normal tissues. Time and again observers like Hauser, Neisser, and others have found that the tissues of healthy animals are so frequently sterile that the occasional gaining of cultures from the organs has been referred by them to contamination in the admittedly difficult task of removal of organs or parts of organs from the body into sterile receptacles. Thus, for example, Neisser out of some 37 rabbits, mice, and guinea-pigs, which he fed with various pathogenic and non-pathogenic organisms, and in certain of which he further set up grave intestinal irritation by giving at the same time croton oil or powdered glass, failed to gain cultures from growths in the liver, spleen, kidneys, lungs, etc., in 24, and only gained cultures, and these in not all the organs, in the remaining 13. His method apparently was the most complete. The animals were skinned, then placed in sublimate solution so as to sterilize the surface, and then fastened out upon sterile boards. The operator, having his hands sterilized, removed each organ in turn with a separate set of sterile instruments, and then placed it in a sterile vessel. Melted gelatin or, rarely, melted agar was then poured over them and only after two days were they examined.

The results seem most positive and what is remarkable is the fact that even when cultures did grow in the organs in general, they were not the identical forms with which the animals had been fed.

Recently, Dr. A. G. Nicholls and Dr. Ford, Fellows in Pathology at McGill University, have been repeating these observations, and it must be confessed that very different results have been obtained, and it has been discovered wherein Neisser was led astray. The animals employed by Dr. Ford have been rabbits, and he has taken precautions similar to those employed by Neisser to guard against contamination. The organ or part has then been dropped into a sterilized bottle containing melted gelatin or melted agar, so that if there were any subsequent contamination by the air it would first of all show itself upon the surface of this solidified medium. Dr. Ford will, of course, publish his whole series of observations later, but he has done sufficient to allow the statement that where organs *immediately after death* are placed in gelatin and kept in the cold, a large proportion remain absolutely sterile and show no growth, whereas when placed in agar and kept at the body temperature, the majority of livers and kidneys show relatively abundant growth after two days or less.

Here again the bactericidal influence of the body tissues come in. It may be that in the organs not immediately removed after death such bacteria as are present undergo attenuation and destruction with fair rapidity, unless, as in cases of disease, they be present in relatively large numbers while at the same time the bactericidal powers of the tissues are depressed. What appears more evident, however, from Dr. Ford's results is that this inhibitory action of the body tissues upon microbes that are accustomed to live at the body temperature is favored by keeping in the cool, or more correctly, that the activity of the growth of the bacteria is depressed.

Before proceeding farther the conclusions which may be legitimately adduced from the facts so far brought forward seem to be the following:

1. Normally there is a passage of leucocytes through the mucosæ on to the free surface of, more especially, the alimentary tract.

2. That these leucocytes while in part undergoing a destruction, in part find their way back between the epithelial cells, bearing with them foodstuffs and solid particles among which may be the bacteria present in the cavity of the gut.

3. That during the active congestion which accompanies digestion the passage out and return of these wandering cells is increased.

4. These cells upon their return find their way either into the lymphatic channels or the venules of the portal system.

5. That in either position they tend to be destroyed and digested by the leucocytes and thus, while preparations of the mesentery and of the mesenteric lymphatic glands may show abundant bacteria, the vast majority of these at the same time show obvious degeneration, while cultures made from the mesentery or from the lymphatic glands on ordinary media by ordinary methods as a consequence tend to remain sterile. Similarly in the normal liver the same rapid destruction takes place so that here again by ordinary methods no evidence of living bacteria is obtainable.

6. By the employment of adequate methods it can be demonstrated that even in the healthy liver and kidney in a large number of cases, in one animal at least (the rabbit), a certain number of living microbes are present at any one moment, so that if the healthy organ be removed from the body cultures of these living microbes can be obtained.

7. It is most probable further that in ordinary health a certain number of bacteria which have not been destroyed by the leucocytes or removed by the lymphatic glands or endothelium of the portal system, pass either through the thoracic duct or through the liver into the systemic blood. Such bacteria tend to be removed more especially by the kidneys, although it may be by other glandular organs. In any case the ordinary methods at present employed in making cultures from blood are inadequate to detect the presence of such bac-

teria unless they are of such a nature or are circulating in such quantities that the whole number is not destroyed by the bactericidal action of the shed blood.

It follows further from these conclusions that there does exist a condition of what the French term latent microbism, or what should be more correctly termed for practical purposes *latent infection.* We have abundant evidence that even in the healthy feces such forms as the pyococci, streptococci, and the bacillus pyocyaneus, are to be encountered fairly often. We know further that the commonest form inhabiting the intestine, that which outgrows all other forms, namely the colon bacillus, even when obtained from perfectly healthy feces may show marked pathogenic properties when inoculated into the lower animals.

We know further as a common fact in pathology that, just as one swallow does not make a summer, an isolated microbe gaining entrance into the system does not usually set up disease. Save when we are dealing with the most virulent forms of pathogenic micro-organisms and with animals which are peculiarly susceptible, it requires numerous bacteria entering at the same time to so lower the resisting powers of the tissues as to thus survive and proliferate. If therefore in the intestine, here and there at scattered points, individual bacteria are being introduced into the system from time to time, that does not necessitate proliferation and consequent infection. But, on the other hand, we can equally well understand that if from some cause or other, as, for example, by inflammation along the intestinal tract, whereby excessive numbers of bacteria are introduced, or, again, in conditions such as are afforded towards the conclusion of long continued chronic wasting disease, the reactive powers of the tissues are greatly lowered, then everything favors the multiplication of bacteria so introduced and the development of either localized —so-called cryptogenetic infection—or of general septicemic disturbances.

The observations of Flexner ("Exper. Med.," Vol. 1, No. 3, 1896) upon terminal infection show in the most vivid light how common it is to have death preceded by such general or local infection by germs totally foreign to the main morbid condition, and amply confirm Osler's paradox that "persons rarely die of the disease with which they suffer" ("Practice of Medicine," p. 132, 1895).

If we accept the conclusions above mentioned we gain a more correct understanding of "post-mortem infection" of the body. The usual explanation of the abundant growth of bacteria in the various organs after death is that, while there may be an agonal invasion of bacteria, the essential cause of such infection and subsequent putrefaction is the entry of bacteria, more especially through the intestines, after death. Birch-Hirschfeld has recently reaffirmed this and has brought forward certain observations of his own in favor of such a conclusion. It is an interesting point that Birch-Hirschfeld in this supposed invasion admits that the various organs show no particular sequence of infection as again that morbid changes appear in the intestine to have no influence on the time of appearance of the bacillus coli communis in the internal organs. It is most interesting further to observe that the period of ten hours mentioned by him corresponds singularly with the period mentioned by Flexner at which the blood of the cadaver loses its bactericidal function, and, lastly, it is of importance to notice that those who have explained the post-mortem infection by this method have never demonstrated what ought to be on this view most clearly demonstrable, namely, the existence of masses of bacteria in special abundance in the intestinal wall and appearing to be growing through that wall into the blood-vessels and surrounding tissues.

It is impossible from the above observations to come to any other conclusion than that at the moment of death, or shortly before, the lowering of the vitality of the tissues permits a larger number of bacteria than normal to be present in the living state in the blood and lymph. Just as when one removes the blood or takes the tissue juices outside the body and adds to certain quantities of these fluids a fair number of bacteria, the tendency is for certain of those bacteria to be destroyed during the first few hours, then gradually for the remainder to multiply; so in the dead body there would seem to be often, but not always, a preliminary period in which the bactericidal action of the tissues continues and the number of bacteria to be obtained from the tissues by ordinary methods is singularly small; following upon this there is multiplication.

But apart from this latent infection and the sudden and acute infection to which it may at times give rise, if we admit this normal passage in and normal destruction of bacteria by the tissues, there would seem possible an intermediate condition which may be termed *subinfection,* a condition of chronic inflammatory disturbance in which as a consequence—in connection with the gastro-intestinal tract—there may for long periods pass in through the walls of the stomach or of the intestine a greater number of ordinary bacteria inhabiting the tract, and while these bacteria undergo the normal and inevitable destruction by the cells of the lymph-glands, the liver, the kidney and other organs. The excessive action of these cells and the effect upon them of the bacterial toxins liberated in the process of destruction may nevertheless eventually lead to grave changes in these cells and in the organs of which they are part; changes which are of a chronic nature. At no individual moment may we find evidence of the presence of large numbers of living bacteria in such organs, but we may find the evidence of their presence in the cells and may find certain chronic inflammations associated with or the result of this overwork of the bacteria destroying cells. It is possible that there may exist a morbid condition, the existence of which has not so far been fully recognized. The absolute recognition and determination of this condition is ren-

dered peculiarly difficult by the fact that any chronic catarrhal or inflammatory condition of the intestines is accompanied by abnormal fermentative changes in the intestine. And thus at the present time it is almost impossible to distinguish and divide conditions which might be due to this combined cell exhaustion and cell intoxication from the intoxication and the disturbances due to increased absorption of soluble poisonous products through the intestinal wall.

Certain observations that I have been making during the last two years lead me to believe in the possibility of such a condition as subinfection. In the first place these minute diplococcoid bodies are to be found peculiarly frequent in the liver cells in cases of hepatic cirrhosis, and, since finding these, the more I have myself made autopsies in cases of this condition and the more I have studied carefully the records of others, the more it has been brought home to me that accompanying ordinary progressive cirrhosis there is a chronic catarrhal condition of the intestines together with a definite enlargement of the retroperitoneal and mesenteric lymphatic glands. Here it is more especially in the cells at the periphery of the lobule that the presence of these bodies is noticeable; in those cells, that is to say, which are first fed from the blood coming from the portal vessels and which again are most liable to undergo atrophy and to be affected by the fibroid change occurring in the interstitial tissues.

The first view, that these little bodies were directly associated with cirrhosis and indicated a specific micro-organism, was rapidly modified by the discovery that cultures from the cirrhotic livers and from the bile in such cases, while at first tending to give a form of diplococcus, subsequent culture and passage through animals developed into a form morphologically unrecognizable from the colon bacillus, while frequently absolutely typical colon bacilli were obtained from these organs and from the rest of the body.

Later there has come a case of well-marked hepatic cirrhosis associated with great pigmentation of the skin and the intense development of the condition known as hemochromatosis. Here in this case, as in other cases of hemochromatosis, there was iron-containing pigment in the liver, the mesenteric glands, the pancreas, and to a less extent in the spleen, kidneys and the heart. What the cause of this hemochromatosis is has been a matter of very considerable conjecture of late years. A very full paper on the subject is to be found in the *Journal of Experimental Medicine* by Dr. Opie of Baltimore. In this he comes to the conclusion that the condition is a distinct morbid entity characterized by the widespread deposition of the iron-containing pigment in certain cells and the association of iron-free pigment in a variety of localities in which pigment is found in moderate amount under physiological conditions. With the pigment accumulation there is degeneration and death of the containing cells and consequent interstitial inflammation, notably of the liver and pancreas which become the seat of inflammatory changes accompanied by hypertrophy; while when the chronic interstitial pancreatitis has reached a certain grade of intensity diabetes ensues and is the terminal event in the disease.

Dr. Mause E. Abbott, who has been working at the Royal Victoria Hospital on this subject for some months, has reached somewhat different conclusions. He finds that this deposit of the iron-containing pigment is not necessarily the morbid entity which Opie would make it out to be. Dr. Abbott's material has been carefuly gone over, and to my astonishment it was found that where this pigment is not clumped together into too large masses, in the liver cells, for example, as again in the abdominal lymphatic glands, a very large proportion of the ultimate fine masses of pigment, reacting to Perl's test and containing iron, are distinct diplococcoid forms or bodies. Of this there can be no doubt. In short the condition of hemochromatosis is of bacterial origin, and just as Hintze and, even before him, von Recklinghausen pointed out, the slightest case of hemochromatosis presents itself merely as a brownish coloring of the abdominal walls. Here we may have a succession of cases in which at first only the abdominal walls and the mesenteric glands become the seat of the deposit of this pigment and to a slight extent the liver, then cases in which the liver is seriously involved with associated or accompanying cirrhosis, and in still others in which the pancreas also becomes the seat of this abundant deposit in the cells of minute pigmented granules which are the modified "corpses" of bacteria.

The appearance of these livers of hemochromatosis is of the same nature as that seen in pernicious anemia, and examining sections from pernicious anemia livers the same minute ovoid and diplococcoid bodies are seen in the liver cells. In short, in pernicious anemia pigmented granules are not merely, as has been thought up to now, a modified substance obtained by the disintegration of red blood-corpuscles, but are the evidence of such a condition of subinfection as that above referred to—the chronic inflammatory condition in the upper digestive tract being associated with excessive passing into the portal blood of colon and allied bacilli which subsequently take up iron-containing pigment from destroyed red corpuscles.

ASEPTIC CATHETERISM.

BY CARL BECK, M.D.,
OF NEW YORK.

CATHETERISM is the most important procedure in the treatment of the genito-urinary tract. As it has the dignity of a surgical operation, it should be viewed from a strictly surgical standpoint and should especially be preceded by the same preliminary precautions, at least in principle. These precautions consist in the sterilization of the instruments, the hands of the surgeon and the field of operation.

As far as the first point, the instruments, in this instance the catheter, is concerned, it can safely be maintained that ideal asepsis has become an established fact, because all objects which stand boiling well can be rendered aseptic in boiling water; a means accessible everywhere. There is no more excuse for a surgeon to claim that "the poor circumstances of the patient's surroundings did not permit of aseptic precautions." Water, fire, and boiling-pot can be obtained in the poorest hut, so that not only instruments but also dressing-material, etc., can be sterilized. The hands of the surgeon should be thoroughly cleaned by mechanical means, *viz.*, scrubbing with soap and hot water. The sterile sand-soap mixture, advised by me, can also be used instead of a brush for scrubbing. Attention must be given to the folds and creases of the skin and the subungual spaces. The latter require the use of a nail-cleaner and energetic wiping with the soap. The skin is then dried with a clean towel and rubbed for about one minute with a gauze compress, saturated with fifty per cent. alcohol. The alcohol is used mainly for the purpose of dissolving the fat of the skin which shelters the bacteria; and by dissolving the shelter, the bacteria are removed at the same time. Whether washing with bichlorid of mercury is needed after these procedures is open to discussion; it will certainly not do any harm. With reference to the third point, the field of operation, we may safely say that if particular attention has been given to the balanopreputial space, that hotbed of different bacterial species, especially the bacterium coli commune, the introduction of bacteria *into* the urethra is surely prevented, provided the instruments and hands of the surgeon were sterilized as described above. The analogue to the balanopreputial space in man is the vulva in woman.

The great stumbling block, however, of thorough asepsis is represented by the fact that even the normal urethra contains numerous bacterial species, some of which unfortunately are pathogenic. Melchior found staphylococci as well as streptococci eight times in twelve cases in normal urethras. It is obvious that in a diseased urethra, and whenever catheterism is considered the urethra is generally in a pathologic state, the number, the virulence, and the varieties of bacteria are increased. While it is simply a matter of conscience whether the introduction of bacteria from without is prevented or not, it is utterly impossible to destroy intra-urethral bacteria. It is claimed that by the injection of one or another antiseptic drug with one or another perfect apparatus these bacteria can be destroyed. It is amazing to find such statements made by surgeons who would ridicule a prophylactic disinfecting process, attempted on the outer surface of the body, which would simply consist in irrigating the field of operation with a mild antiseptic. The modern surgeon is contented only after scrubbing with soap and water and subsequent application of alcohol and bichlorid of mercury or a similar antiseptic. And even then there is another surreptitious enemy of asepsis, intracutaneous bacteria, which should not be underrated. These cannot be reached by any disinfecting process. They are set free as soon as there is an injury of the integument, and it is only by protecting the skin margins of the wound with sterile compresses, after the skin is dissected, that they can be kept in check.

No precaution of this kind, however, can be taken in the urethra, which, moreover, is a much more congenial resting place for bacteria than the skin surface of the body. In the first place, scrubbing with soap and water and wiping with alcohol and bichlorid of mercury or similar procedures are out of question, and as far as antiseptic drugs are concerned, we can only resort to the mildest, since strong solutions would not be borne by the mucous membrane of the urethra. So it can hardly be expected that by simple irrigation of a mild antiseptic, the intra-urethral bacteria can be destroyed. And if there is an injury, be it caused by a cutting instrument or by the friction of a catheter, not only bacteria of the intra-urethral surface but also those sheltered by the follicles have a good opportunity to infect the adjacent tissues. This finds its simple clinical illustration in the fact that whenever blood shows after catheterization there will be a chill, the injuring instrument having opened an avenue for infection. So we see that thorough prophylactic disinfection of the urethra is still a pious wish. This, however, should not encourage any sins of omission. There are surely several points the observation of which will lessen the chances of infection. In the first place irrigation of the surface of the mucous membrane of the urethra will remove a certain number of bacteria. A much more important point is to avoid even the slightest injury while introducing a catheter. Any slight amount of friction may cause an abrasion and thereby open a way for infection. Force must therefore never be used during catheterism. The instrument always tells distinctly how far the surgeon may go, but it is necessary that its language be understood by the surgeon. Bearing in mind the fact that the bacteria in the lacunæ and follicles are set free by dissection, extensive intra urethral operation should be omitted whenever other means can be found to obtain the desired effect.

A third point is that, being unable to rely upon our usual aseptic methods, we should resort to those antiseptic principles which are applicable to the urethra. In other words, as our active antiseptic drugs, like bichlorid of mercury, etc., cannot display their valuable properties as fully in the urethra, we would better rely on a passive bacterial destroyer, like iodoform, which, while powerless where there is no injury, displays its unequalled properties in the presence of a lesion. Therefore I advocate the prophylactic injection of a five per cent. emulsion of iodoform in glycerin before the introduction of an instrument in the urethra. If an abrasion is caused, the iodoform will come in contact with the wound at the very moment it is made, and with the wound-serum at

its *stadium nascendi*. Iodin is set free, and during this chemical process bacteria are destroyed or their development at least is arrested.

Thus we see there are three most important virtues required in catheterism: Thorough cleanliness, extreme delicacy, and much patience. The same principles should be upheld if the patients are instructed to catheterize themselves. From a scientific standpoint, the trusting of such a surgical procedure to a layman is to be deplored, and such risky commissions should be resorted to only under the most pressing circumstances. Soft catheters should be chosen, and the fact that their usefulness is soon destroyed by repeated boiling should not be allowed to carry much weight in such a serious consideration.

CLINICAL LECTURE.

A SERIES OF CASES OF PISTOL-SHOT WOUNDS OF THE HEAD.

BY CHARLES PHELPS, M.D.,
OF NEW YORK.

THE following cases of pistol-shot wound of the head, nine in number, have occurred in my service in two hospitals during the last two years:

Case I.—Ambulance history: Bullet of 0.38 caliber entered the head just in front of the right ear, and made its exit in the left anterior parietal region. The wound of entrance was lacerated and one inch in length; the wound of exit was lacerated and measured one-half by one-fourth-inch in diameter; brain matter was extruded from both wounds; consciousness was primarily and permanently lost. The right pupil was dilated, the left contracted, and the corneal reflexes abolished. On admission to the hospital, thirty-five minutes after injury, the patient was still in a condition of general shock; the skin was cold and moist, pulse 120, respiration 20, and temperature 101.6° F. The right pupil was still dilated, and the left less contracted. The respiratory movements became slower and of the Cheyne-Stokes character, edema of the lungs developed and death occurred in fifty minutes.

The primary symptoms in this case can only be attributed to general cerebral contusion, and those which immediately preceded death were due to hemorrhage into the occipital basal fossæ compressing the medulla and pneumogastric nerve.

Case II.—Ambulance history: Bullet of 0.38 caliber, fired from a revolver of foreign make, entered head one and one-half inches above and one-half inch in front of the right ear. There was free hemorrhage from the left ear and from both nostrils. No cutaneous exit. Loss of consciousness was complete, and death occurred before the patient reached the hospital.

Necropsy.—Cutaneous lesions: The hair, which was short, curly, and moderately thick, was burned down to the scalp around the wound in an area of one and one-half inches. The skin was charred over an area of three-fourths of one inch, and symmetrically scorced just at the margin of the wound except inferiorly, where the scorch extended three-fourths of one inch beyond the charred area; there were no free grains upon the surface, and none embedded, and no smoke deposit beyond the hair. The cutaneous wound was one-eighth of an inch in diameter. Subcutaneous lesions: The bullet track was blackened and contained free grains of powder; there was no other staining of the tissues or laceration, and no separation of the layers of the scalp. Osseous lesions: The osteal wound was irregularly circular and one inch in diameter; the eroded margin of the internal table of bones was powder-stained. Intracranial lesions: The bullet penetrated the brain immediately above the fissure of Sylvius in its middle portion, emerged through the superior surface of the left frontal lobe, lacerated the dura mater, and comminuted the left frontal bone just anterior to the coronal suture and one inch to the left of the median line. The bullet was then deflected downward and backward, traversing the left lateral ventricle, and was stopped in the median line above the cerebellum. There was no powder-stain of the dura mater, and but few powder-grains in the cerebral track of the bullet. There was little intracranial hemorrhage.

Case III.—Ambulance history: Bullet of 0.38 caliber, Smith & Wesson, fired from a cheap pistol, entered the head two inches above and one inch behind the right external angular process of the frontal bone and made its exit at a point near the center of the left frontal region without having penetrated the bone. The patient was pulseless and unconscious. On admission to the hospital consciousness had been regained, temperature was 99.4° F., and there were no general symptoms. The wound of entrance was circular, one-fourth of one inch in diameter, clean cut, and its edge was not burned; the hair was scorched in an elliptical area of two and one-half inches in its long diameter; the skin was scorched in an area of one by one and one-half inches, and powder-grains were embedded with traces of smoke in an area of one inch. The subcutaneous track of the bullet was found after the wounds of entrance and exit had been connected by incision to be powder-stained and the external table of bone to be depressed in a circular area of one-eighth of one inch in diameter with a fine semi-circular fissure above it. On the second day the patient became actively delirious; on the third day the temperature rose from 101° F. to 104.6° F., and rectal and vesical control was lost. The pupils were normal, and the delirium was thought to be of alcoholic origin. On the fourth day the mental condition became clearer and the temperature was reduced to 101° F. On the fifth day the temperature rose to 104° F. The pupils were somewhat contracted. There was alternate stupor and delirium, and there were muscular twitchings and picking at the bed-clothes, with continued loss of control over the feces and urine. On the sixth and seventh days the pulse was weaker and more frequent, and the temperature

varied from 103° to 105.6° F. On the eighth day the patient died in coma with a temperature of 106° F.

Necropsy.—Cutaneous lesions had disappeared. The osseous lesions were confined to external table; skull at site of injury three-sixteenths of an inch in thickness; no increase in subarachnoid fluid; trivial cortical hemorrhage upon surface of third right frontal convolution posteriorly derived from minute laceration at that point; pial hemorrhage over posterior part of right occipital lobe; general edema of brain substance with marked hyperemia of both occipital lobes and of right basal ganglia.

This case is one of the admitted exceptions to a general rule which has been formulated, that a pistol ball never causes a simple fracture and rarely a compound fracture, which is more than nominal unless the bone is also penetrated.[1]

This pistol-shot injury was attended by a fatal result and obvious intracranial lesions were disclosed. Death resulted from cerebral hyperemia and edema, the cerebral laceration and hemorrhage having been too insignificant to have occasioned symptoms; but while the pial hemorrhage and the localization of hyperemia in certain regions of the brain indicated the effects of traumatism, the patient's history and his early symptoms indicated also the influence of alcoholism. Whether the cerebral contusion would have proved fatal had the circulatory conditions not already been disturbed may be open to question. If, however, as it may well have been, the impact of the ball although causing so little osseous injury was solely or essentially responsible for the cerebral lesions this case is not only exceptional but remarkable.

Case IV.—Bullet of 0.38 caliber entered the head one inch behind and a little above the right external angular process of the frontal bone and was lodged in the subcutaneous tissue of the left upper eyelid; it was removed by incision. There was said to have been profuse hemorrhage from the nose, subconjunctival hemorrhage in both eyes, and ecchymosis of both orbital regions. It was also said that there were no general symptoms then or immediately afterward. The patient was admitted to Bellevue Hospital one month later and was then rational. Vision in the left eye was lost, and was limited in the right; temperature 99° F. On the morning of the following day a severe chill lasting twenty minutes was followed by a temperature of 103° F., which in twelve hours rose to 105° F. On the following day the condition of stupor lapsed into coma, which continued until death, which occurred on the fifth day. The urine was retained except on the second day, when there was loss of bladder control. On the last day there were general convulsive movements. The temperature after the day of invasion was of lower range. On the third day it was from 102.6° F. to 103.8° F., on the fourth day from 100.6° F. to 102° F.; and on the fifth day from 100.6° F. to 102.8° F.

[1] Phelps, "Injuries of the Brain," pt. II., pp. 335-336.

Necropsy.—The bullet passed through the upper part of the right orbit, and nasal fossæ into the left orbit, fracturing the orbital roofs without perforating the orbital periosteum, but driving spiculæ of bone into the inferior portion of both frontal lobes. Areas of purulent infiltration were scattered through the left orbit.

The dura mater was congested, thickened, and adherent to the pia mater. A layer of creamy yellow pus covered the entire surface of the brain, extended into the spinal canal, and was very abundant over the medulla and inferior surface of the cerebellum. The pia mater was closely adherent to the cerebral cortex in various parts. The cortical tissues were soft and edematous.

Bacteriological cultures afforded a mixed growth of the diplococcus intracellulosis meningitidis, of the bacillus coli communis, and of a short thick bacillus positive to Gram's stain not yet identified. (Brooks.)

Case V.—Bullet of 0.32 caliber entered the head one inch behind and one-half inch above the right external angular process of the frontal bone; no exit; hair scorched in area of one and one-half inches diameter, and skin in area of one inch; powder grains embedded in area of one-half inch; and smoke stain thick in an irregular area of approximately two inches diameter below and behind the wound.

Primary symptoms: Temperature 98° F., pulse 76, respiration slow and shallow; patient conscious but apathetic; pupils contracted and only slightly reacting to light; vision in right eye diminished; urinary control retained; no muscular symptoms. There was hemorrhage from the right nostril; blood and brain matter escaping from the wound. Fragments of the internal table of bone were removed, and the probe easily followed the ball track to a point near the left orbital plate. The wound healed at once without suppuration.

Later symptoms: There were no general symptoms aside from an abnormal mental condition until the twenty-fourth day, when the patient became unconscious. He was always apathetic and when sufficiently roused to make answer to questions was incoherent and his power of comprehension was deficient. Nourishment was given with great difficulty. Vesical and rectal control was lost with consciousness; at about the same time the lower extremities became rigid and their reflexes exaggerated. Death occurred on the thirty-first day.

The temperature until the eighteenth day ranged from 98° F. to 100° F., except on the fourth and fifth days, when it rose to 103° F., and on the eleventh day, when it rose from 98° F. to 104° F. From the eighteenth to the thirty-first days it ranged from 102° F. to 106.2° F. The pulse was ordinarily from 40 to 60, and only exceeded 100 towards the close of life.

Necropsy.—There was no epidural hemorrhage; the dura mater was adherent and there was a diffused subarachnoid seropurulent effusion. The crista galli was broken off. Upon

section the anterior half of the left frontal and anterior third of the right frontal lobe were each found to contain a large area of thick, creamy material, including fragments of bone and lead. A cylindrical area of softened material one-half inch in diameter extended from the disintegrated portion of the left frontal lobe through the left lateral ventricle to the postero-inferior part of the left occipital lobe, at the termination of which the bullet was lodged one-half inch below the surface. Small particles of bone and lead and a few grains of powder were found in the left frontal lobe outside the area of disintegration. The frontal sinuses communicated with the cranial cavity and contained a seropurulent fluid.

These last two cases exemplify the special danger from fractures involving the anterior fossæ of the cranial base. It is practically impossible to guard against infection through the throat and nose. In both of these cases septic arachnitis supervened; in Case IV. the path of infection must have been either through the orbital periosteum or through the ethmoidal cells; in Case V., although it might have led through the frontal wound, the late invasion of the disease makes it more probable that it was through the frontal sinuses in which a suppurative process was found to exist in continuity with that of the cranial cavity. In Case V. the predominance of mental symptoms during the time consciousness was retained was quite in accordance with what the writer has noted as characteristic of lesion of the left frontal lobe. The contention made in the work upon "Brain Injuries," previously quoted, that laceration of that lobe, either with or without laceration of the right lobe, occasions mental aberration or decadence, which is absent when the right lobe alone is injured, has since been sustained by the observation of a second series of cases of which this is one.

Case VI.—Bullet of 0.32 caliber entered the head immediately above the right external angular process of the frontal bone, inflicting a cutaneous wound one-eighth of one inch in diameter; the skin was scorched in an area of three inches, powder-grains were embedded in an oval area of two inches in its long diameter, and there was orbital and subconjunctival hemorrhage. The bullet was firmly imbedded in the bone, which was fissured toward the root of the nose.

The bullet was removed and the inner table of bone was found to be shattered and the dura mater wounded. Drainage was employed for three days. No general symptoms occurred at any time.

Case VII.—Bullet of 0.38 caliber entered the head one-half inch above and in front of the right external auditory meatus; the top of the ear was shot away; powder-grains in area of three inches; skin unburned; tips of hair singed; hemorrhage from right ear; temperature, 99.6° F., pulse 64, respiration, 16; consciousness retained. On the following day the pupils were dilated but responsive to light and accommodation, the cervical muscles were rigid and somewhat painful, and the temperature ranged from 99° to 100.2° F. The patient was then transferred to another hospital, opportunity for explorative examination not having been afforded, and nothing is known of his subsequent history, except that he was discharged from there two months later.

Case VIII.—Bullet of 0.22 caliber entered the head one and one-half inches behind the left external angular process of the frontal bone; wound minute; no burning of hair or skin; smoke area of two inches in diameter; powder-grains embedded in temporal muscle but not in the skin; stellate depressed fracture; bullet embedded in a fragment of bone and lying upon the dura mater, which was black with powder-grains and contused but not lacerated; depressed bone and dura mater powder-stained in area of one inch.

The bullet was removed and the depressed bone elevated by use of trephine and rongeur. No general symptoms followed.

The patient admitted that though not left-handed he had shot himself with his left hand to induce the belief that his wound was homicidal. This case has therefore a medico-legal significance. The fact that a right-handed person was shot in the left temple might seem to justify an inference that the wound was not self-inflicted; but this instance of attempted wilful deception on the part of the wounded person demonstrates the worthlessness of any deduction from such a purely hypothetical premise.

Case IX.—Bullet of 0.38 caliber, Smith & Wesson, entered the head one-fourth inch behind the right ear, making a vertical wound one and one-fourth inches long; another wound extended through the ear into the meatus auditorius externus. There was no burn, smoking or powder-stain of the skin and no embedded grains of powder. The edge of the wound was blackened and the subcutaneous tissues were infiltrated with powder. The osseous wound was two-fifths of one inch in diameter. The probe, on being passed into the petrous structure, detected neither bullet nor loose pieces of bone.

On admission the patient's mental condition was normal; ten minutes afterward three general convulsions occurred in rapid succession and were followed by coma. On the following day the mouth was drawn to the left; an inability to close the right eye was ascertained later to have existed prior to the present injury. The temperature after admission remained at 101° F.

The osseous wound was enlarged with a chisel and the bullet extracted. The bullet was split in its long axis and its two portions extended upon each other at a very obtuse angle, forming a mass one and one-eighth inches long lying in the long axis of the petrous portion, which it seemed to fill. A number of osseous fragments, constituting a considerable portion of the petrous process were removed, the removal of the last portion being followed by a small extrusion of brain matter. The patient recovered without the occurrence of general symptoms.

These cases in their aggregate are fairly rep-

resentative of that minority of pistol-shot wounds of the head which are not immediately fatal. If the one be excluded which failed to reach the hospital ward the fatalities and recoveries are in equal number. One only of the recovering cases was of importance. In this the brain was lacerated and life was probably saved only by operation. In two other instances, Cases VI. and VIII., in which the dura mater was wounded or contused, early operation, if the result of recorded cases in which it was neglected may be taken as a criterion, also saved the patient from mishap. In two of the fatal cases the bullet made complete exit; in the third it was removed from the eyelid, and in the fourth it remained in the brain until death on the thirty-first day. In the final case the bullet was lodged at a site admitting counter-trephination. The preliminary examination, however, revealed a deflection in its course which prevented even a conjecture as to its location, and the hospital had no apparatus for making examinations under the X-rays. Necropsy proved that its retention had no influence in the development of fatal symptoms; it was the fragments of bone and lead which were as usual the source of danger and disaster.

There can be at the present time no reasonable doubt that all pistol-shot wounds of the cranium and all those involving the cranial cavity should be carefully explored and that as far as practicable not only the bullet but all fragments of bone should be removed.

CLINICAL MEMORANDUM.

A CASE OF POLYDACTYLISM.

BY A. L. BENEDICT, M.D.,
OF BUFFALO, N. Y.

THE photographs from which the accompanying cuts were reproduced were taken during one of my vacations, and as the case is entirely outside of my practise they have not been hitherto published. The patient was a boy of seventeen,

Fig. 1.

Showing extra toe.

Fig. 2.

Showing extra finger.

otherwise normal, and with no significant family history, unless his belonging to the Jewish race, which is the purest and most highly inbred encountered among American Caucasians, has some remote etiologic bearing on the deformity. Each extra digit has a distinct articulation with the fifth metatarsal or metacarpal bone, respectively. The tendons, so far as could be determined, are the same as for the fifth digits. Independent muscular action of the sixth digit is impossible. Two or three years previously, the patient had purposely twisted the sixth toe on to the dorsum of the foot, for greater convenience in wearing shoes. Except for the difficulty of wearing a glove, the patient experiences no difficulty with the hand, and he can catch a ball, pull an oar, and indulge in similar exercises as well as most boys.

MEDICAL PROGRESS.

Sarcoma in the Stomach of a Child Three and a Half Years.—FINLAYSON (*Brit. Med. Jour.*, December 2, 1899) mentions a case of sarcoma of the stomach in a young child which puzzled the physicians during life and which was only recognized at autopsy. Vomiting was a prominent symptom although it did not seem to have any special relation to feeding, and the vomited material was in no wise characteristic. There was constipation alternating with diarrhea. The child was profoundly anemic and his anemia and weakness were progressive up to the time of death. A tumor, which was supposed to be the spleen, was

felt in the left hypochondrium. Pain was not present. At autopsy the tumor was found to occupy the posterior wall and a part of the greater curvature. It measured an inch across the mucous surface and two inches externally. The sarcoma of the spindle-celled variety.

Unusual Gunshot Wound of Brain.—BARKER (*Lancet*, December 2, 1899) reports a case in which a man with suicidal intent discharged two shots from a revolver through his mouth upward and backward. For forty-eight days there was occasional vomiting. There was at first no paralysis, but later the power in the left arm and leg was considerably reduced. The temperature was at no time over 100° F. Consciousness was not at any time suspended. After six weeks the vomiting ceased, the slight headache of which he had complained disappeared, and the power of the left arm and leg increased so that he was soon able to walk. Both bullets were shown by skiagraphs to lie within the skull. Making due allowance for the different size of the shadows and that of the man's head, the operator's calculations led him to the conclusion that one of the bullets struck against the vertex and fell backward into the median fissure. In describing the effect of the shot, the patient said that he felt the bullet rattle against the vertex. As long as the presence of the bullet caused no serious symptoms Barker concluded that it was best to leave it alone, but on the sixty-sixth day the patient had a convulsive seizure lasting from three to five minutes. Two days later he had a similar attack and an hour after the second a third; on the following day he had a fourth. On the following day an osteoplastic flap was sawed out and turned back with the base toward the middle line, thus exposing the longitudinal sinus without injuring it. A probe passed along the fissure in the direction in which the bullet was supposed to lie touched the bullet, and it was removed with forceps under the guidance of the little finger. The finger acted better than the probe as during a coughing spell, the latter produced slight injuries to several vessels and to the brain substance. There was, however, very little bleeding. The dura was stitched in place as far as possible and the osteoplastic flap replaced. Consciousness returned rapidly but sensation and motion were absent from the whole left side with the exception of the face. They returned slowly, and a month after operation, while there was fairly good sensation, the use of the left arm and leg was still very imperfect. Afterward the power of the muscles greatly improved, but the epileptic fits recurred so that a year after the injury, Chipault of Paris trephined and separated some adhesions between the two hemispheres. For nine days prior to this operation there were from sixty to one hundred epileptic seizures in a day with complete hemiplegia. After the operation the epileptic attacks disappeared and there was a steady gain in power in the left leg and arm.

Chemical Nature of Enzymes.—From a physiological as well as from a purely chemical standpoint the enzymes, or ferments, form one of the most interesting groups of organic compounds. In *Science*, December 29, 1899, O. LOEW classifies them as follows:

1. Enzymes which are intimately connected with nutrition, as diastase, pepsin, trypsin, lipase, etc.

2. Enzymes which cause oxidations—the oxidases.

3. Enzymes which bring on coagulations, the clotting enzymes: rennet, thrombase, pectase.

The first group has been known the longest and best. The practical importance of the others is increasing daily. In addition to these enzymes which act on glucosides, fats, carbohydrates, and true proteins, there are a number of others which are active in limited spheres. Certain fungi and mites attack the keratin in the hair and skin. Certain other insects and fungi attack the chitin of insects' wings. A large and important group is made up of the bacteriolytic ferments, produced by certain kinds of bacteria themselves. These enzymes play an important rôle in the recovery from and immunization against infectious diseases. It is of interest to note that certain bacteria produce enzymes that later kill the bacteria. Thus *bacillus pyocyaneus* "commits suicide by means of its own enzyme." Loew suggests three important questions with reference to these bodies. (1) Are the enzymes proteins or not? (2) How can one explain the fact that a very small amount of an enzyme can transform a relatively large amount of another compound? (3) What is the cause of their quite specific action, the reason that they can only attack a specific compound and not other, even closely related ones? In answer to the first question, it seems probable that different enzymes may exist in every one of the protein groups, and some may exist that are not proteins, although derived therefrom. No satisfactory answer has yet been found for the second question. The closest analogies seem to exist between the catalyptic phenomena known of certain metals. These are dependent, in the case of enzymes, on the liability or activity of chemical interchange whereby enzymes are capable of transforming heat energy into chemical energy. This clinical energy is capable of being transferred to other compounds. The answer to the third question is a much involved chemical one, depending upon molecular structure.

New Method of Skin-grafting.—KELLOCK (*Lancet*, November 25, 1899) has hit upon a method for providing a large piece of skin for use as a graft. By the ordinary methods, if a thick piece of skin is taken it fails to unite, whereas a thin Thiersch graft, while uniting easily, does not prevent cicatricial contraction. The author's method is to mark out a square piece of skin and to cut on its four sides a thin Thiersch graft, leaving it attached in the central portion which is then dissected up from the subcutaneous tissue. Such a graft, if properly applied to a raw surface will unite almost as readily

as an ordinary Thiersch graft, while its thick center, comprising the whole thickness of the cuticle, limits cicatricial contraction. The wound caused by its removal may be approximated by sutures or may be covered by a thin graft.

Tuberculosis of the Kidney.—Usually cases of tuberculosis of the kidney do not come under the physician's eye until the symptoms are so well marked that a diagnosis is comparatively easy—to make a diagnosis early requires considerable skill. A method described by C. P. NOBLE and W. W. BABCOCK (*Amer. Gynecol. and Obstet. Jour.*, December, 1899) enables one to make a diagnosis in an early stage or in a case of obscure character. This method consists in catheterizing the urethra with sterile catheters and collecting the urine. The sediment from the urine thus obtained must then be injected into guinea-pigs. If a kidney is tubercular the urine from it will infect the guinea-pig, as they are extremely susceptible to the tubercle bacilli. The objection to this method of diagnosis is the time required for its completion, as from four to six weeks are necessary. Care must be taken that the catheters and the tubes into which the urine is collected are sterile and that all sources of contamination are avoided. The writers report a case in which the diagnosis, made in this manner, was corroborated by an operation on the affected kidney. The sediment of the urine was used and about 1.5 c.c. from each kidney was injected respectively into two guinea-pigs. When the guinea-pigs were killed the one which received the sediment from the right kidney showed tubercular deposits. The operation on the right kidney showed a large suppurating tubercular kidney.

Action of Euphthalmin.—The physiological action of euphthalmin, a recent substitute of atropin, has been carefully studied in an article by GELANTO VINCI (*Therap. Monatsh.*, December, 1899). In both cold and warm-blooded animals there is noted a primary irritation of the nervous system in the form of restlessness, excitement, increased reflexes, and respiration, then tonic and clonic spasms, opisthotonos, exophthalmos, and disturbed respiration. Later, a general paralysis supervenes, but before death the excess of carbon dioxid may again cause convulsions. Peripheral nerves, especially the motor, suffer paralysis, but this in animals occurs later than the centric changes. The heart shows the characteristic vagus paralysis of atropin, preceded in small doses by a slowing of the pulse. Despite the increased cardiac activity, blood-pressure falls, since the vasomotor system is directly paralyzed. Of especial interest is the salivation caused by instilling the drug into the conjunctiva; it disappears later and is due to irritation and paralysis of the secretory fibers of the chorda tympani. Mydriasis begins fifteen to twenty-five minutes after the use of 2 to 3 drops of a two to ten-per-cent. solution, reaches its maximum in three-quarters to one hour, and disappears after three to eight hours. It is also seen after the internal use. It is due to a paralysis of the nerves of the sphincter iridis, without any irritation of the sympathetic dilator fibers. Conjunctivitis or general symptoms never follow the use of ordinary solutions and the fact that intraocular pressure does not seem to be increased makes its use in glaucoma possible.

Thyroid Extract in Tuberculosis.—In a lecture delivered before the Tuberculosis Commission in Munich by E. KLEBS, and reported in the *Berliner klin. Woch.* (December 11, 1899), the author dilates upon the good results attained in tuberculosis by the use of expressed juice of thyroids. The administration of this drug is not entirely empirical but is founded upon well-directed experimentation. Thus, it is well known that there are many cases of tuberculosis in which the changes in the lungs are very slight, while the chief symptoms and danger are referable to the stomach. Most of these cases suffer from *achylia gastrica*, accompanied by a heretofore little observed thyroid atrophy. Klebs had previously experimented upon animals in which the thyroid gland was extirpated and found the same stomach conditions as obtain in tuberculosis. Such animals could be kept alive on fluid diet for a long while, whereas the ingestion of solid food was followed almost immediately by severe nervous manifestations. Following these experiments, he extirpated one of the thyroids of a healthy dog (previously weighed carefully), locating the position and size of the other gland as exactly as possible. Then he injected tubercular toxin subcutaneously, in not sufficient dose to kill, in the dog's body at a distance from the remaining thyroid gland. After ten to twenty such injections he obtained the results anticipated in the stomach of the animal. The gastric contents were studied by means of fistulæ. As a result of the analyses there were found absolutely no HCl. and no pepsin. The thyroid gland was found to have decreased in weight and size to almost one-half of its previous dimensions, and the colloid substance had disappeared entirely. The epithelial cells were unchanged in themselves, but were scattered within the lumen of the gland. As a result of these experiments, Klebs conceived the idea of feeding tuberculous patients having severe achylia gastrica with freshly prepared thyroid secretion. To demonstrate his success, he cites two cases in which the bodily weight increased markedly as a result of thyroid feeding.

Treatment of Scabies.—The use of a soap containing as active ingredient the extract of tobacco in scabies and other itchy skin diseases is highly recommended by J. MARCUSE (*Therap. Monatsh.*, Dec., 1899). His directions are to wash in warm water morning and evening, and after each cleansing to thoroughly shampoo the entire body with this soap, the foam of which is allowed to dry on the skin. After three or four days of this

treatment, a warm bath is taken, when the cure is generally affected. As advantages of this procedure are mentioned the absence of skin irritation and relapses and the cheapness of the material employed.

Pathology of Aneurism of the Aorta.—ARNOLD HELLER of Kiel (*Münch. Med. Woch.*, Dec. 12, 1899) comes to the conclusion that aortic aneurisms in the majority of cases represent the results of a syphilitic process. After drawing attention to such facts as the great frequency of these aneurisms in syphilitics, the occasional presence of them in both man and wife, and the good results achieved with antiluetic treatment, the author presents sufficient pathologic evidence to warrant his belief that these lesions are but rarely caused by a primary chronic endarteritis. Microscopically the changes manifest themselves in a circumscribed or more diffuse infiltration of round and giant cells, involving primarily the media, along whose vasa vasorum the process is most active. As a result, the muscular element will undergo more or less destruction with obliteration of its nutrient vessels. The new growth will secondarily involve the intima, leading to thickening and even projection into the lumen of the vessel. Atheromatous abscesses which so frequently are seen in chronic endarteritis do not, however, occur. Eventually even the adventitia may be invaded, and the cellular tissue will become more fibrous, so that finally the tunica are hard and cicatricial. The process is analogous to syphilitic lesions in the viscera and differs greatly from chronic endarteritis; in old people, however, the two are often seen combined. While the author thus satisfies himself as to the purely luëtic character of aortic aneurisms, he is not willing to admit that these structures may not occasionally have a different etiological basis. Thus aneurisms by rupture or embolism may occur, and there is no reason to believe that other infectious diseases, such as typhoid, may not lead to changes in the arterial walls with subsequent yielding. In true aneurisms, however, syphilis is the only factor of importance, hence an active antisyphilitic treatment should always be advised.

Heroin and Its Advantages.—The usefulness of heroin, a derivative of morphin, in allaying the cough of phthisis, acute and chronic bronchitis, and pneumonia, is strongly urged by H. D. FULTON (*N. Y. Med. Jour.*, Dec. 30, 1899). In the phthisis cases in which the patient is harassed by an almost incessant cough or by severe paroxysms occurring especially at night, the value of this drug is particularly noticeable. It is usually administered in $^1/_{16}$ grain doses every three hours, and is followed by a marked freedom from cough and thereby restful nights. It does not seem to require an increase in dosage, and stomach symptoms appear only when large doses are prescribed. In acute bronchitis it seems to ameliorate somewhat the severity of the attacks, but its chief indication is to tranquilize the persistent cough. A solution of heroin for hypodermatic administration may be prepared by the addition of a small amount of acetic acid and will be found equally efficacious as morphin and less objectionable in cases of spasmodic asthma.

Injection Treatment of Pleurisy.—An interesting report of the results following the treatment of serous effusions into the pleural cavity by the injection of irritants is given by C. H. LEWIS (*Med. Record*, Dec. 30, 1899). The methods of emptying a pleural cavity of fluid are (1) by aspiration and (2) by absorption through the lymphatic channels. The former, which is by far the more rapid, would be an ideal method were it not for the frequent recurrence of the fluid and the necessity for repeated operations. When spontaneous absorption occurs it usually leads to permanent results, but it is generally so slow, even when aided by the drainage of the system through the bowels, kidneys and skin, that the patient becomes greatly debilitated. When nature produces a permanent cure the surfaces of the pleura are found to be firmly glued together, preventing any encroachment of fluid. The object of the injection treatment is therefore to imitate nature by stimulating the exudation of fibrin, which acts as a cement substance as the fluid is absorbed. In order to safely inject an irritating solution so that it will act upon all surfaces bathed by the serous effusion, certain conditions must be fulfilled. The irritant must be in permanent solution, it must be aseptic, and the volume of the fluid must not be changed. Experiments were made with iodin, permanganate of potash, and the analine dyes, fuchsin and methylene blue. All proved unsatisfactory except the blue, which is antiseptic; anodyn has diuretic properties and is easily detected in the urine. The ideal vehicle for this irritant was found to be the serum freshly drawn from the pleural cavity, which is a good solvent and at least would introduce no new germs. A large aspirating syringe was used with a rubber tube attached to the outflow tube of the syringe and extending into a glass graduate which holds the methylene blue. A glass rod for mixing the blue and serum was inserted with the rubber tube into the graduate and the entrance plugged with cotton. The whole outfit could then be easily sterilized. Twenty cases of pleurisy with effusion were treated by this method. From eight to fifteen grains of methylene blue were mixed with from fifty to one hundred cubic centimeters of the fluid, withdrawn and then reinjected. All the patients were discharged cured on an average of 13.1 days after the injection was made. In four cases paracentesis was performed a few days after injection without apparently hastening the convalescence, and internal medication did not materially affect the recovery. It seems reasonable to suppose that the antiseptic power of the blue acts directly upon the germ which in many cases is undoubtedly the tubercle bacillus and also stimulates the exudation of the fibrin cement.

Surgical Treatment of Phthisis.—W. C. WOOD (*N. Y. Med. Jour.*, Dec. 30, 1899) mentions four methods of surgical treatment in phthisis: Aspiration and medication; pneumonotomy; pneumonectomy; and obliteration of the cavity by causing collapse of the lung. Aspiration is easy and safe, but unsatisfactory because good drainage is impossible and direct medication futile. Pneumonectomy is satisfactory because of good drainage. It is indicated when the tuberculous involvement is not extensive but the patient is suffering from septic symptoms of an easily recognized cavity, in the hope that relief from sepsis will allow the tuberculous lesion to heal. The operation consists of superiosteal resection of a rib and incision of the parietal pleura. If the visceral pleura is not adherent to the parietes, one may do either a primary incision of the lung or wait until adhesions have formed. An aspirating needle is used to determine the location of the cavity; and the lung is incised with the cautery if it is soft and inflamed, or with the knife if it is hard. Irrigation is not admissible and the cavity contents must be kept from the bronchi. The lung is not sensitive. Pneumonectomy is not a legitimate procedure for pulmonary tuberculosis. Obliteration of the cavity by causing collapse of the lung results from injecting nitrogen into the pleural cavity. The enforced rest of the lung assists cicitrization. The gas should be left in the pleura for from three to six months; it remains unchanged and when it is withdrawn the lung readily expands. Septic infection and injection of nitrogen into the lungs must be avoided. Patients consent readily to this procedure and receive immediate benefit. A sufficient number of cases have not yet been reported to establish its general application.

The Thyroid and the Menopause.—It is well-known that there is some connection between the generative organs of both sexes and the thyroid gland. C. R. BURR (*Boston Med. and Surg. Jour.*, December 21, 1899) reports the case of a woman, fifty-six years of age, who had an apoplectic stroke, nearly a year and a half after her menses had ceased, in which she lost power of speech and the use of her right side. Since the menopause she has had the numerous nervous symptoms generally attributed to that period. There were flushings, neuralgias, hysterical attacks, a rapid pulse, and loss of weight. Nine months after the apoplectic attack there was marked tremulousness, flushed face, and an injected eye. Speech was thick. She perspired profusely, was markedly emotional, and her pulse was from 100 to 120. She could not endure any pressure about the neck. Both eyes were prominent and the thyroid gland was enlarged. Tincture of belladonna, ♏ ii t. i. d., was prescribed, as the writer decided that it was a case of exophthalmic goiter. At the end of two weeks the sense of oppression around the neck had disappeared, the thyroid could hardly be felt, all the nervous symptoms were diminished or absent, and the eyes were no longer prominent.

The thyroid is congested during menstruation, coition, pregnancy, and accouchement. It is not known definitely whether its secretion is also increased, as it is with the congestion in exophthalmic goiter. It would appear from the above case, the writer thinks, that the menopause caused the congestion of the gland, and that the active principle of the secretion caused an auto-intoxication, as in exophthalmic goiter. The symptoms of the menopause are very similar to the secondary symptoms of thyroidal intoxication. A number of other symptoms presented by the patient were also attributed to the intoxication caused by the excess of thyreoglobulin in the circulation.

Calculus in the Ureter.—H. MORRIS (*Lancet*, December 16, 1899) has tabulated a number of cases in which operation was performed for ureteral calculus. It is necessary to note the seat of inpaction. In 19 it was within two inches of the kidney, in 15 just before passing through the vesical wall, and in 11 about at the level of the brim of the pelvis. It is worth remembering that 12 of the 15 cases in which impaction at the lower end occurred were in women. In most of the cases in which the stone was impacted near the renal end it was discovered after exploration of the kidney, the kidney itself containing no stone. Whether or not a calculus has been found in the kidney, a surgeon should never conclude a nephrotomy for stone without passing a probe into the ureter. In the present state of our knowledge of the symptoms of stone in the kidney and stone in the ureter, the two conditions cannot always be differentiated; since with stone in the kidney the greatest pain and tenderness may be in the course of the ureter, while in case of impacted ureteral calculus there may be other stones in the kidney, giving rise to pain and tenderness in that organ. In very thin persons a stone impacted above the brim of the pelvis has sometimes been felt. If the stone is near the bladder ecchymosis around the ureteral orifice may be detected by the cystoscope. Attacks of pain and hematuria, extending over some days or weeks, and gradually progressing downward, should arouse suspicion of ureteral calculus. A small calculus with sharp processes is apt to stick in the wall of the ureter, and give more trouble than a larger and smoother one. If both ureters are obstructed at the same time fatal uremia is likely to occur. Some have asserted that if a calculus exists in only one ureter reflex action may stop the flow of urine through the other kidney. Morris denies that such a mishap can take place if the other kidney is structurally healthy. Dilatation of the kidney is apt to occur in those cases in which the calculus is in the upper end of the ureter and from time to time slips back into the pelvis of the kidney. If it remains in the ureter the latter will be permanently blocked either by the calculus itself or by the fibrous tissue which forms around it. Under such circumstances the kidney will in time be

converted into a fibrous mass or a small sac. If a calculus is known to have blocked a ureter, medicinal treatment should not be long continued on account of danger to the kidney and even to the life of the patient. Extraperitoneal ureterotomy should be performed and the calculus removed. If possible the calculus should be displaced upward and removed a little above the point from which it has been lodged; by this means an incision through the damaged wall is avoided, and if the calculus is below the pelvic brim the operation is greatly simplified by lifting the calculus out of the hollow of the sacrum. In the cases reported by Morris, 33 patients recovered after operation and 12 died. It is only fair to state, however, that in most of the fatal cases obstruction or even complete suppression of urine had lasted for several days before operation.

Antitussin in Whooping-Cough.—There are few drugs in the Pharmacopeia which have not been used in the treatment of this affection and with all of them the result has been doubtful. Bromoform, antipyrin, pertussin (Taeschner's) have all been weighed in the balance and found wanting. In the *Berliner klin. Woch.* (December 11, 1899) MAX HEIM gives the results of his experience in 16 cases of whooping-cough treated with the very latest preparation, namely, antitussin. This is an organic compound of fluorin mixed with vaselin and wool-fat (di-fluor-di-phenyl, 5; vaselin, 10; adep. lanæ hydros, 85 parts). In many of the cases failure had followed the use of the above-mentioned favorites, even pertussin, about which so many favorable reports have been heard. In no instance did antitussin fail the author in the attainment of much-hoped for results. As the fluorids are all badly borne by the stomach the administration of antitussin is best carried out in the stated form of an ointment which is applied to the neck, chest, and interscapular region of the back. Before applying it, however, these regions must be carefully washed with soft soap and rubbed dry with a rough towel. The quantity of ointment to be used should be about two or three drams and the rubbing should be continued until all the salve has disappeared. In 7 cases the treatment was begun before the convulsive stage was reached, the other 9 cases after convulsive coughing seizures had made their appearance. The diagnosis in the first series of cases was naturally difficult but the author was enabled to arrive at it partly by means of the circumscribed redness and swelling in the region of the vocal bands (Hagedorn), and partly by the fact that the disease was rampant in the neighborhood at the time and its transmission from patient to patient easily demonstrable. The second series of patients was largely made up of severe and even dangerous ones. The patients were some of the age of only four months, and their environment of the worst possible; the attacks were of severe nature, followed frequently by epistaxis; the general health of the patients was very poor, and in many cases only a fatal issue seemed possible. In every single case, however, after the application of antitussin, there appeared a speedy and at times surprisingly complete relief from attacks. None of the ordinary sequelæ of whooping-cough such as bronchiectases, cheesy degeneration, and so on, was demonstrated by the author. He follows the presentation of his cases with several general considerations, *viz.:* (1) Antitussin makes the attacks of pertussis much milder, changing the character of the disease to a purely catarrhal one; (2) the drug loosens the phlegm and mucus markedly, allowing the patient to relieve himself with ease; (3) the number of attacks diminishes as early as the second day of treatment to one-half, and daily thereafter until entirely gone. The period of convulsions, variously estimated at from five to ten weeks, is reduced to from a few days to at most two weeks; (4) as antitussin is comparatively non-poisonous in the amount used, no untoward results of its administration are witnessed. In all throat and laryngeal affections the preparations of fluorin, especially antitussin, are highly recommended. They relieve the catarrhal conditions and the many annoying reflexes (sneezing, coughing, etc.), as well, in a remarkably short time. Antitussin, therefore, is a drug which seems to be the one much sought for by the medical profession for many a year.

Practical Points on Diseases of the Rectum.—All physicians recognize the difficulty of obtaining a patient's consent to a rectal examination when the symptoms point to some local disturbance. Perhaps more success would be met with if the physician thoroughly appreciated the natural hesitancy toward such an examination which nearly all patients most properly feel. Many valuable hints in regard to the necessity of giving careful attention to the history of the case and of reassuring the patient before an examination is suggested, together with a few most practical points upon the more common diseases of the rectum, are given by L. H. ADLER, JR. (*N. Y. Med. Jour.*, Dec. 30, 1899). He most strenuously insists upon the desirability of a local examination before a diagnosis is ventured and most certainly before treatment is begun. To illustrate his remarks he quotes from Dr. Charles B. Kelsey, who says, "In my own practise I am guided by the simple rule that patients, male or female, who have not yet come to the point which makes them willing to submit to an examination, have not yet reached a point which admits of treatment."

With reference to proctitis and periproctitis considerable stress is laid upon the tendency toward suppuration, which is so often followed by fistula and requires free incisions of the affected parts. In cases of fistula the internal opening is to be found in most cases between the two sphincter muscles and not, where most practitioners seek it, higher in the rectum. The injection

of a colored solution, such as milk or potassium permanganate, may assist in the location of the internal opening. Simple cases of fistula may be operated on with very little pain by the use of cocain or eucain and the patient need not be confined to bed. Fissure of the anus gives such characteristic symptoms of severe pain during and especially immediately after defecation that a diagnosis can usually be made, but an examination should always be made. The best medical treatment consists in the use of iodoform, preferably in the form of a 10-grain suppository, of which one should be carefully inserted into the rectum half an hour before an expected movement and another immediately after the passage has occurred. Hemorrhoids do not always require operative treatment. In the formative stage frequent ablutions of the part with cold water will allay, if not abort, inflammatory tendencies of the veins which otherwise lead to piles. Acute inflammation is not a contra-indication to operation when the case demands such a measure. Furthermore the consent of a patient can be more readily obtained while suffering, and external hemorrhoids may be painlessly removed with an alleviation of all the symptoms. The correct way of ascertaining the presence of a benign growth, such as a polypus, is to carry the finger well up the bowel away from the side to be explored, and then, by steady pressure, to sweep the finger downward, continuing this procedure all around the bowel. In this way a polypus, if present, will be caught between the finger and the wall of the rectum.

Treatment of Tubercular Glands.—W. W. CHEYNE (*Lancet*, Dec. 16, 1899) has come to the conclusion that tuberculosis of the cervical glands may be due to direct infection with bacilli entering them through the throat or some other organ. In many cases, however, trouble with the teeth, tonsils, etc., leads to an acute infection of the glands which, when it subsides, leaves them in a weakened condition. In consequence they form favorable soil for the growth of tubercle bacilli brought to them by the blood. In a similar manner tuberculosis develops in a joint which has been weakened by a sprain Tuberculous cervical glands may be considered under five heads. There may be a number of small hard glands which show no tendency to become softened or to mat together. Patients in this condition should be kept in good hygienic surroundings and treated medicinally. The glands may grow to such an extent that they cause a great deformity. This condition is usually bilateral. It may last for a long time without the occurrence of suppuration or the matting together of the glands. Such glands when removed generally contain caseous patches or calcareous nodules. Hygienic treatment has little effect upon glands in this condition, and a free incision should be made and all the affected glands removed as early as possible. The third type of cervical tubercular adenitis is one in which one or more glands grow rapidly, suppurate, and become matted together. If left to themselves their pus breaks through the skin. The neck of a patient in this condition presents numerous abscesses and ulcers. Incision of a suppurating gland, followed by a scraping away of its contents, is an unsatisfactory procedure, since other glands remain and rapidly enlarge and suppurate. As in the former class of cases a wide incision should be made and all the enlarged glands removed. The teeth, tonsils, etc., of the patient should be examined and treated if necessary. In a fourth class of cases suppuration remains limited to one or possibly two glands; it goes on until the gland substance has been entirely destroyed. The condition is then that of an abscess, usually limited to the gland capsule, and therefore beneath the deep fascia. If this is the case it should be entirely excised. Before it breaks through the fascia, its own substance has usually been completely destroyed. Hence the abscess may be opened and its cavity cleaned out, scraped and injected with iodoform and glycerin emulsion. A fifth condition in which such patients present themselves is one in which there are one or more sinuses leading down to remnants of gland structure. Such sinuses are themselves of a tubercular character and if possible they should be thoroughly excised. If this is not feasible each sinus should be scraped and swabbed with pure carbolic acid.

The situation in which the glands are most commonly affected is the anterior triangle of the neck. If recurrence is to be avoided it is necessary not only to remove all fat and glandular substance, leaving the vessels and muscles clean, but also to pull aside the sternomastoid in order to remove the fat and glands beneath it. The operation is simplified if in its very beginning the internal jugular vein is exposed at the lower part, it can then be avoided while the affected tissue is dissected away from it. If the glands have suppurated and are closely attached to the vein, the operator need not hesitate to divide it between ligatures and remove it. In working beneath the sternomastoid muscle care should be taken not to injure the spinal accessory nerve. The best plan is to turn back the muscle and expose the nerve in its upper portion, or else to divide the muscle. The glands may then be dissected away from its under surface, both above and below the nerve. If the operator proceeds in this methodical way recurrences in the anterior triangle will rarely take place.

Uterine Scrapings and Diagnosis of Cancer.—Pain, discharge, and hemorrhage were considered formerly to be the characteristic symptoms of cancer of the uterus. To try to make an early diagnosis from these symptoms J. WIENER (*Am. Jour. of Obstet.*, Dec., 1899) thinks would be impossible and dangerous. He says there are no symptoms that are pathognomonic of cancer of the uterus. Of these three symptoms, pain is of least value, as it does not occur until late in the disease. When discharge is present in the early

stages it is not due to the new growth, but to a pre-existing endometritis. Hemorrhage is a more valuable aid in that it arouses our suspicions—it cannot do more, but it should do that, especially at the time of the menopause. Many times the menopause is held responsible for symptoms which are in reality due to a beginning malignant growth. Wiener thinks that we are too apt to look for the disease in older women and to overlook it in younger. He cites statistics which show that the disease occurs between the ages of twenty-one and forty-five in 62.4 per cent. of 705 cases. Endometritis is a very important factor in the etiology. The methods which will help us to reach a diagnosis are inspection and palpation, dilatation of the uterine canal and introduction of the finger, and microscopical examination of uterine scrapings. Inspection and palpation do not tell of the character of a growth even if we succeed in seeing or feeling one. Introduction of the finger into the dilated uterine canal will only allow one to feel an ulceration or a new growth, and simply suggests the part to scrape most thoroughly. Microscopical examination of uterine scrapings is the only reliable way of making an early diagnosis of uterine cancer. A differential diagnosis must not be made from the scrapings between uterine cancer and endometritis, glandular or interstitial, necrotic myomata, polypi, placenta retenta, and abortion. Wiener refers to statistics in which out of 58 cases of hysterectomy for uterine cancer, 41 were diagnosed solely from the microscopical examination of the uterine scrapings, and the diagnosis confirmed. He also presents four cases of his own in which an early diagnosis was made from scrapings of the uterus. Therefore, from his own experience and from cases cited, he concludes that cancer of the uterus should be diagnosed with the microscope, that it should be suspected at all ages—in virgins, in nulliparæ, as well as in multiparæ—and that a typical hemorrhage should always arouse suspicion, even at the time of the menopause. With early diagnosis and early operations, the mortality due to malignant disease of the uterus would be much lowered. Sixteen illustrations accompany the article.

A New Infusion Mixture.—It is well known that the addition of calcium and other salts to isotonic solutions favorably influences the heart's action, but it is less readily recognized that an ideal infusion mixture should contain among its constituents a substance capable of binding the carbon dioxid which has accumulated in the remaining blood. Normally this is accomplished by the presence of an alkaline globulin compound in the circulatory blood, which, in the presence of carbon dioxid, splits up with the formation of an alkaline carbonate and free globulin. It is not likely that these unstable compounds will maintain their integrity during the process of transfusion of blood from one individual to another; quite to the contrary, it is probable that the heart is still further weakened by this procedure due to the potassium salts which are liberated by the breaking down of blood-corpuscles which always occurs here. A. SCHIEKING (*Thera. Monatsh.*, Dec., 1899) states that it may be impossible to artificially reproduce the complex globulin compounds, but he has found in sodium saccharate a valuable drug which seems to possess all the properties of the former. This salt is a gelatinous, freely soluble, bitter chemical, which in the presence of carbon dioxid forms sodium carbonate and sugar, thus binding the gas. The clinical use of this body has fully borne out the expectations which such experiments as the reanimation of apparently dead hearts of frogs and also of warm-blooded animals permitted the author to hope for. No deleterious effects were ever noticed, and good results have been seen even where the use of the usual salt solution failed to improve the patient. A solution containing 0.03 per cent. of the compound with 0.7 per cent. sodium chlorid is recommended, but care must be taken that the mixture contains neither free sodium hydrate nor sugar. The internal use of the saccharate is also advised in all cases where alkalies were formerly employed.

Treatment of the Initial Lesion of Syphilis.—When excision or destruction by other means is not feasible, the following methods may be employed according to the location of the lesion:

1. Within the vagina or at the portio vaginalis. Apply mercurial ointment on cylindrical or round cotton pads to which a thread is attached to facilitate removal. In pregnant woman no pad, however small, should be introduced, but rather a suppository made as follows:

℞ Ung. hydrarg.....gr. lxxv
Ol. theobrom.....3 ii ss.
M. Ft. suppos. No. X. Sig. Insert in vagina.

Or the lesion may be painted with one of the following solutions:

A.
℞ Hydrarg. chlor. corros.....gr. ¾—iii
Spiritus..... } aa.....3 ii ss.
Aetheris sulph. }
M. Sig. External use.

B.
℞ Hydr. chlor. corros.....gr.. ⅓—iii
Collodii..... } .....3 ii ss
Aetheris sulph. }
Ol. olivæ.....m. iii.
M. Sig. External use.

2. On the buccal mucous membrane, tonsils, etc. Paint with the alcoholic-etheral solution of corrosive sublimate given above.

3. On the skin, or at the junction of skin and mucous membrane (lips, alæ nasi, female genitals, etc.). Cover the lesion with a piece of gray plaster, making it fit as smoothly as possible by means of incisions in its edge. Let it extend well over the border of the lesion. The renewal of the plaster should depend on the amount of secretion. The induration clears up rapidly, while ulcerations and erosions heal most satisfactorily by this method.—Lang, "XX. Century Practice."

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No. 111 FIFTH AVENUE, NEW YORK.

Subscription Price, including postage in U. S. and Canada.

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SATURDAY, JANUARY 6, 1900.

THE PAST YEAR'S ADVANCES IN MEDICINE AND SURGERY.

ONE of the striking features of the past year is the position that surgery has taken in the treatment of diseases of the gall-bladder and gall-ducts. These affections have been wont to run a most uncertain and unsatisfactory course under medicinal management, and it has now become clear that early operative intervention is destined to take them out of the physician's hands. Expectant treatment for gall-stones, once it has become manifest that the attacks of pain are recurring, will soon be a thing of the past.

In the treatment of intestinal obstruction and intussusception surgery has also asserted itself, and operation within the first twenty-four hours after diagnosis, or as soon as it is clear that medical measures fail to give relief, is henceforth to be the indication. In cases of typhoid perforation, operative interference as soon as the diagnosis is established has been emphasized, during the past year, as the only justifiable rule of procedure.

Two successful methods of treatment seem worthy of particular mention in the review of the year. Pagenstecher reported a case of stab-wound of the left ventricle of the heart, in which, twenty-four hours after its infliction, he successfully inserted four sutures. The three deep sutures penetrated the entire thickness of the heart muscle, leaving only the endocardium intact. It was with the greatest difficulty that the uppermost suture could be inserted, because its site was not visible except when the heart raised itself up and twisted on its axis during systole. The manipulations necessary for the insertion of the sutures did not perceptibly disturb the heart's rhythm or action. This is the tenth case of active surgical interference in wounds of the heart, and six of them have been successful. The mortality of these cases under expectant treatment was from 80 to 90 per cent. The second notable success was the cure of four cases of volvulus, with all the classical symptoms of that affection, by the simple method of having the patient, while maintaining as nearly as possible a horizontal position, roll over in bed. The attempt to turn, if made in the direction of the twist in the intestine, is followed by immediate increase of pain, while even a partial turn in the opposite direction brings relief, and several turns untwist the ileus completely, with absolute cessation of symptoms.

In medicine the notable event of the year has been the definite determination that a special form of mosquito is the host and the carrier of malarial infection. It is evident that the discoveries in this line are soon to bear abundant fruit in the prophylaxis against the disease and its ultimate eradication from infected regions. In general the advance of civilized nations into the tropics has led to a great increase of knowledge of tropical diseases. England and Germany, as well as our own country, have taken a commendable interest in this work, and it is evident that the question of the habitability of the tropics by white men is soon to be settled in the affirmative.

Progress in general medicine has been more along the line of better appreciation of details than distinguished by any single noteworthy advance. Improvements even in such old-fashioned diagnostic methods as inspection and palpation are not wanting. The shadow that the diaphragm makes on the chest-wall in thin people and the corresponding shadow of the abdomen made by a dilated and partially filled stomach, under similar conditions, have become significant features of physical diagnosis. The percussion of the vertebral spine is now made to convey valuable information for the solution of such difficult diagnostic problems as aneurism, enlargement of the intrathoracic glands, and mediastinal tumors. The

vertebræ act excellently as pleximeters. The use of certain organs as the spleen and liver as pleximeters in percussion, to elicit information from beneath them, has also developed, and promises to be of value.

In some directions physicians have been undoing the work of too hasty conclusions. The resistive vitality of the individual rather than the virulence of microbes is now recognized as the determining factor in the course of disease. The claims of discoverers of the specific germ of rheumatism have brought out more clearly than ever that in even simple acute rheumatism there is present not a single entity, but a series of pathological conditions due to many causes. The fact that contributions of the great body of the profession rather than that of a single genius have influenced medicine during the past year, is a matter for congratulation. It is well known that gradual progress made all along the line is more effective in permanent advance than sudden bounds which are apt to overleap the mark, leaving the future to discount unwarranted assumptions.

HORSELESS VEHICLES AND MUNICIPAL HEALTH.

IN what unexpected directions new inventions may be productive of important results, is frequently a matter of great surprise. Who could have foreseen that the introduction of gas as an illuminating agent would work a revolution in materia medica and therapeutics? Yet this has actually happened. The much-used, also much-abused, analgesics and antipyretics are mainly coal-tar derivatives obtained from a by-product.

Equally surprising will doubtless be the achievement of the horseless vehicle in its effect upon the healthfulness of cities. In an article in the December number of the *Automobile Magazine,* J. J. Walsh points out that there are certain diseases whose incidence in our great cities will greatly diminish as the results of the absence of the horse from city streets. Tetanus will very probably disappear completely. It is on horse fodder that the germ is introduced into cities and the principal sources of its dissemination are the intestinal discharges of the animal. With the elimination of the horse, therefore, will doubtless disappear also that dread disease.

There are certain indirect effects, moreover, which seem worthy of consideration. The disposing of horse droppings constitutes the principal work of the street-cleaning department and their absence will greatly simplify the cleaning of streets. Then with the advent of the horseless vehicles universally comes the rubber tire. This means absence of noise and freedom from its ceaseless wear and tear upon the nervous system.

From a sanitary point of view there is every reason for those who are interested in municipal health to encourage in every possible way the automobile movement. Accidents from the new motive power will undoubtedly occur. The foolish and careless will abuse a good thing despite every precaution. Mechanism will sometimes get out of order. It is not at all probable, however, that the accidents under a horseless régime will be comparable in frequency to the numerous casualties that happen now. There are therefore many reasons to rejoice that we shall soon inaugurate in our large cities the horseless era.

THE AMERICAN CIGARETTE.

AMONG the many lines of scientific inquiry that have been undertaken by the London *Lancet,* not the least important is its investigation into the subject of tobacco and its adulteration. Through its Analytical Sanitary Commission it has had this subject under consideration at successive intervals since the year 1853. Its report of that year was based on the analysis of a great number of samples of tobacco and cigars purchased from shops in London. The decision then reached was that there was no evidence to show that such adulteration as was discovered was of a kind to produce injury to health.

Since that date the cigarette has been introduced in every-day life, and in 1888 this same commission analyzed the chemical constituents found in the tobacco and the paper of cigarettes and reported that there was no trace of opium nor any unclassified alkaloid in the tobacco, not a trace of chlorid or arsenic in the paper, but that there was a faint trace of copper due to the metallic lettering on the paper wrapper. The exaggerated statements concerning the adulteration of cigarettes and the poisonous constituents of the paper continue unabated, and a more recent investigation of cigarettes purchased in New York and the same brands of cigarettes sold in London has been made by the same commission. The results of this last investigation are published in the issue of the *Lancet* of December 9th as follows: "As a matter of fact, the results in both cases show no foundation whatever for the exaggerated statements that have been made. Foreign toxic substances

were not found in a single instance; amongst those looked for both in the paper wrapper and in the tobacco were morphia, phosphorus, arsenic, mercury, copper, and other heavy metals. The only evidence of a metal being present was in the case of copper in the paper. The quantity present was so excessively minute as to put any question of its being injurious beyond consideration. To sum up, there is not a single feature in these numerous results upon which can be fairly based any allegation of the presence of a substance producing injury to health."

It seems from this that the injurious effects of cigarette smoking result from the excessive or premature use of them. The almost constant custom among cigarette-smokers of drawing the smoke into the lungs may also be mentioned in this connection, although the commission says that it is doubtful whether any nicotine ever reaches the mouth of the smoker except that present in the moistened tobacco which is in contact with the lips. The smoke products of tobacco do not contain any important quantity of nicotine. There are toxic bodies, however, in the smoke. These are related to that interesting series of organic bases known to chemists as pyridines, but about which not much is at present known.

ECHOES AND NEWS.

NEW YORK.

Bellevue Park Completed.—The yard of Bellevue Hospital has been changed into a park, which was opened on December 23d by the playing of a spouting fountain of quite splendid proportions.

New St. John's Hospital.—The new St. John's Hospital, at Twelfth street and Jackson avenue, Long Island City, will be consecrated and will have its doors thrown open on January 7th. This hospital, which is under the direction of the Sisters of St. Joseph, will accommodate over 200 patients.

Dr. Weir a Delegate to the International Congress.—Dr. Robert F. Weir, President of the American Surgical Association, has been appointed by the Secretary of State one of the delegates of the United States Government to the Thirteenth International Congress of Medicine to to be held at Paris, August 2 to 9, 1900.

Doctor a Morphin Victim.—Dr. Edward M. Bangs, forty years of age, a guest of the Cosmopolitan Hotel, was committed to Bellevue Hospital on December 29th to have his sanity determined. He was found on reception to be a victim of the morphin habit. Dr. Bangs is not a resident of this city. His home is not known.

Busy Day for Ambulance Surgeons.—New Year's day was a very busy one in the ambulance department at Bellevue Hospital. Fifty-six calls were answered. This is the heaviest day's work since the summer of 1896, when so many people were prostrated by the heat. At that time 154 calls were answered one day and 101 another day by the Bellevue surgeons.

A Nurse's Funeral.—Miss Margaret Alice Burr, twenty-five years of age, a nurse in the City Hospital on Blackwell's Island, died there on December 23d. Her body was taken to her home in Troy. The hospital internes and Miss Burr's thirty companions, the latter in their uniforms, marched to the Island dock and stood uncovered until the boat conveying the body was in mid-stream.

Priest as an Ambulance.—A negro painter, while at work on a new building on Elton avenue, fell three stories to the ground and sustained several fractures. A crowd gathered but nothing was done to help the injured man until Father Murphy, a Catholic priest, came along. He took the man on his shoulders and carried him seven blocks to a drug-store, whence he called up an ambulance from Fordham Hospital.

Contagious Diseases.—The Health Department submits the following report for the week ending December 30, 1899: Measles, 450 cases and 20 deaths; diphtheria, 257 cases and 46 deaths; laryngeal diphtheria (croup), 10 cases and 7 deaths; scarlet fever, 154 cases and 17 deaths; chicken-pox, 28 cases; tuberculosis, 105 cases and 142 deaths; typhoid fever, 33 cases and 13 deaths; cerebrospinal meningitis, 5 deaths. Totals, 1037 cases and 250 deaths.

The Post-Graduate Hospital.—The fifteenth annual report of the Post-Graduate Hospital states that 1617 free patients were treated as in-patients and were given 38,313 days of care. The whole number of patients was 2688, and 1447 patients were visited in their homes, without charge. There was free home attendance in 368 obstetric cases. An account of the hospital's work on the East Side is given, and an appeal is made for the endowment of the laboratory and the lying-in department.

The Academy of Medicine.—The Treasurer's report of the New York Academy of Medicine for the year ending December 15, 1899, has been published. The report certainly shows a most flourishing condition financially. The report of the trustees shows an indebtedness on the building of $2000.00. Since the Treasurer's account was audited, however, Fellows have subscribed an amount sufficient to meet this outstanding note and the institution, therefore, begins the new year free from debt.

Alcoholism and Traumatism.—A Brooklyn policeman recently found a man in a helpless con-

dition in Atlantic avenue. The surgeon who was summoned made the diagnosis of acute alcoholism. The man was taken to the police station, where he lay until next morning, when the police, not being able to arouse him, again summoned the ambulance. This time the surgeon diagnosed a fractured skull. A number of similar cases have occurred in Brooklyn of late. They occur much too frequently in a great many places.

Brooklyn Hospital Surrenders.—Negotiations are in progress for the transfer of the Brooklyn Homeopathic Hospital, Dispensary, and Training School for Nurses, by the trustees, to the city authorities. It is expected that the control shall rest in the city along with the actual property and obligations of the institution, and that in return the city shall agree to maintain it under the homeopathic system. The property is worth about $150,000, and there are obligations amounting to $60,000. The hospital was organized in 1852.

Death of Dr. Winston.—Dr. Gustavus S. Winston, son of the late Frederick S. Winston, who was for many years President of the Mutual Life Insurance Company, died on December 29th from apoplexy. He was sixty-six years old. He was a graduate of Columbia and of the College of Physicians and Surgeons. In the Civil War he was surgeon of the Eighth Regiment. Having been captured and confined in Libby Prison, he escaped through friends of the Winston family, who, although Southerners, sympathized with the North. Dr. Winston was for about twenty-five years one of the medical directors of the Mutual Life Insurance Company, and for the greater part of that time was its chief director. He was a member of a number of clubs, a charter member of several medical societies, and a Fellow of the New York Academy of Medicine. He was Visiting Physician to St. Francis Hospital.

St. Bartholomew's Year Book.—The year book of the Parish of St. Bartholomew was issued on December 29th. The receipts during the year were upward of $208,000 and the expenditures were $207,729.90. The charities of the parish include the clinic, the employment bureau, the loan bureau, the penny provident fund, the kindergarten, the tailor shop, and the fresh-air fund. Through one or another of the many benevolent agencies incorporated within this parish hundreds of persons have been aided during the past year in securing food and work. This book affords an opportunity to contrast church work as it was in the past and as it is in the present day. Formerly, the spiritual welfare of the parishioner and his preparation for a future life were alone considered. Nowadays a large, perhaps the largest, part of the work of a great church in a large city seems to lie in the direction of improving humankind as regards material conditions and during the present life. Two of the most faithful and most earnest workers in the parish, Cornelius Vanderbilt and William H. Appleton, have died during the past year.

State Care of Consumptives.—Since the adjournment of the last Legislature at Albany a special committee of the State Board of Charities, composed of Commissioners Harvey W. Putnam of Buffalo, Enoch V. Stoddard of Rochester, and Dr. Stephen Smith of New York City, has been considering the establishment of State hospitals for consumptives and the promulgation by the State Board of Health of regulations which will tend to prevent the spread of tuberculosis. The committee will submit its report to the State Board of Charities some time during this month. The committee will recommend that every locality able to have a hospital for consumptives should have one, and that the State should erect and maintain one or more hospitals where localities unable to maintain local hospitals might send their patients and pay for their care and maintenance. It will also recommend that local boards of health should have more power in dealing with consumption; that it should be declared to be a contagious disease, and that the boards of health should have power to establish rules and regulations to protect the public from contagion.

CHICAGO.

Examinations for Medical Inspectorships.—The Civil-Service Commission recently completed the returns of the examination for positions as medical inspectors in the Chicago public schools. Of the 250 physicians who took the examination, 93 failed to secure the required standing. Many of these were old, gray-haired, and experienced physicians.

Many Criminals Convicted.—States Attorney Deneen reports that the year 1899 has been an unusually busy one in his office from the standpoint of criminology. There were 6911 cases on the docket and 4278 disposed of, there being 3117 convictions; there were 219 acquittals, and 150 defendants were found not guilty by the court, while 93 cases were nolled, and 45 were nolled by request of the prosecuting witness.

Examination of Osteopaths.—On December 29, 1899, the Illinois State Board of Health conducted a special examination for licenses to practise in Illinois as osteopaths. The class numbered thirty-four, most of whom were students of the American School of Osteopathy at Kirkville, Mo. The branches in which they were required to pass a satisfactory examination were anatomy, physiology, chemistry, histology, pathology, and hygiene.

Consumptive Hospital in Chicago.—The Citizens' Committee, which has taken the initiative for the erection of a $150,000 hospital for consumptives, under the auspices of the Sisters of St. Elizabeth's Hospital, has received assurances during the last week that their plans will have the

support of the physicians of Chicago. The physicians favor the hospital not only for the care of the afflicted, but also for the protection of the public from infection.

Treatment of Tuberculosis.—Professor Edwin Klebs read a paper on this subject before the Chicago Society of Internal Medicine, December 28th, in which he discussed the specific treatment by products of tubercle bacillus to reenforce the probably insufficient natural defenses of the body. He dwelt upon the action of tuberculin R. and tuberculocidin. He pointed out the insufficiency of specific treatment in tubercular persons with secondary infection. He said that achylia gastrica and thyroid atrophy were the effects of the action of tubercular toxins, and advanced experimental and clinical proofs.

Cerebellar Tumor.—Dr. D. A. K. Steele reported an interesting case upon which he had operated. The patient, a male, was thirteen years of age. After numerous skiagraphs had been taken it was thought the tumor was located in the left frontal convolution. As the condition of the boy was growing worse, and he was having involuntary evacuations from the bladder and bowels, and racking headaches, the left frontal lobe was trephined to relieve the intracranial pressure. The specialists who had examined the boy thought the data were insufficient to localize the tumor. In Dr. Steele's opinion no operation for the removal of the supposed cerebellar tumor was justifiable, as the boy was not expected to live and the recovery of such patients operated on for cerebellar tumor is unsatisfactory. However, the patient was subsequently operated upon, and a cerebellar tumor found on the left side instead of the right, as diagnosticated, it being situated in the left hemisphere of the cerebellum. The patient died forty hours after operation. The dimensions of the tumor were two inches in width, one and one-quarter inches in length, and one and one-half inches in its vertical diameter. It was situated close to the median line and pushed the right and middle lobes of the cerebellum to the right. Sections showed the typical structure of a glioma.

Medical Practise Act in Illinois.—On November 25th, Judge Tuthill announced a ruling holding that the State Board of Health of Illinois, under the Act of 1899, relating to the regulations of the practise of medicine in the State, has no authority to inquire into the actions of medical men who have received certificates entitling them to practise medicine in the State prior to the passage of the 1899 act, which went into effect July 1st. The interpretation of the law was made on the issuance of an injunction to restrain the State Board of Health from proceeding further in the steps taken by it to revoke the certificate of Dr. W. Frank Ross of Champaign, who was summoned before the Board to answer charges of unprofessional conduct made against him. The injunction petition filed by Ross stated that he was actively engaged in the practise of his profession in Champaign, and that the revocation of his certificate would be a serious injury to him. Attorney Allen, in behalf of Ross, contended that the 1899 statute, entitled "An Act to Regulate the Practise of Medicine in the State of Illinois," completely repealed all prior acts and by its express provisions limited the power of the board to only inquire into and revoke such licenses as would be issued after its passage. The State Board of Health by Attorney Cope argued to the court that the law should be construed in the light of the intention of the Legislature as expressed by all the acts passed on the question.

Vesicorectal Anastomosis.—Dr. Jacob Frank made a further report on vesicorectal anastomosis for the relief of exstrophy of the bladder and other pathologic conditions. He presented the gross specimen with the results of the bacteriologic and microscopic examinations made for him by Dr. Herzog of the dog killed before the meeting, held November 22, 1899. The external operation wound in the median line of the abdominal wall was completely healed. On opening the abdominal cavity the peritoneum, including the omentum, and all the abdominal structures appeared normal and free from any inflammatory change or reaction. The anastomosis between the bladder and rectum was firm and covered by a smooth, normal peritoneum. Before the anastomosis was examined any further, except for inspection *in situ*, the kidneys were lifted out of their position and inoculations were made from the pelvis of each kidney into glycerid agar tubes in the usual manner. The ureters on both sides were then resected loose down to their insertion into the bladder. The kidneys and ureters were normal in color and size. The kidney substance, on being brought to view by a median incision into the organ, was found to be normal. The anastomosed bladder and rectum on being removed were found to be normal. The bladder was very firmly contracted to its maximum. The mucous membrane of both bladder and rectum looked perfectly normal. The opening between bladder and rectum was small. The tissues which formed it were corrugated and perfectly normal in appearance. All the other organs of the animal were normal. The four test-tubes inoculated from the pelvis of the kidneys were kept in the brood-oven at blood temperature for six days; they remained absolutely sterile, and no growth of any kind developed. Histologic examination of the tissue of the cortex, as well as of the medulla of both kidneys, showed it to be normal. The pelvis of the kidney on either side was lined with normal epithelium. The subepithelial tissue of the pelvis showed a moderate amount of round-cell infiltration. The cells forming this infiltration were of the type of young connective-tissue cells and lymphocytes. Polynuclear leucocytes were not seen in the subepithelial tissue. Bacteria of no kind could be demonstrated either in the pelvis, the medulla, or the cortex of the kid-

neys. From the result of the microscopic, histologic, and bacteriologic examination, this dog was free from any infection of the kidneys and was to all appearances in perfect health.

GENERAL.

Students at Berlin.—At the Berlin University there are registered this winter 6478 students. This is the largest number ever assembled at a German university. Of the whole number 1346 are students of medicine.

Famine in India.—The present famine in Western India is destined to be far more disastrous than that of two years ago. The plague has already begun now, and the epidemic, going hand in hand with the famine, is destined to work distressing ravages.

$100,000 to Study Cancer.—By the will of Caroline Brewer Croft, who died in England nearly two years ago, a sum amounting to nearly $100,000 has been placed in the hands of the corporation of Harvard University, to be used in the investigation of cancer.

Smallpox among Indians.—There are serious epidemics of smallpox among the Indians in the Indian Territory, at Crow Creek Agency in South Dakota, and on other reservations. The Department of Interior at Washington has been telegraphed to from a number of agencies to forward vaccine points, but it is confronted by a lack of funds.

Extraction of Foreign Body from Bronchus.—It is reported that Dr. Schroetter of Vienna extracted, without cocain or other anesthetics, a piece of lead from a bronchus. The lead was located by means of the X-rays at the height of the fourth rib. A Kilian's bronchoscope was inserted and electrically lighted, and by the aid of this the lead was extracted with a specially constructed pincette.

Responsibility in Appendicitis.—C. Mansell Moullin, in a recent communication to the *Lancet*, delivered himself of the following ultimatum: "If in a case of inflamed appendix thirty-six hours have passed without definite improvement having shown itself, the responsibility for the consequences must, it seems to me, rest with those who recommend that an operation should not be performed."

Whisky in the United Kingdom.—The consumption of whisky during the year 1898 was the highest ever reached in the United Kingdom, according to the English temperance journals, being more than a gallon a head for every man, woman, and child. Compared with 1878, there has been an increase in deaths from chronic alcoholism of 82½ per cent. among men and of 145½ per cent. among women.

Mountain Toothache.—"Mountain toothache" or "jumping toothache" seems prevalent among the engineers and laborers on the Jungfrau Railroad, at a height of 8500 feet above sea-level. Several teeth are affected at a time, the attack lasts seven or eight days, and leaves the patient with a swollen face, which it takes another week to reduce. After that the teeth are acclimated and give no further trouble.

Favorable Opening for a Physician.—Opportunities now and then arise where the needed change of climate can be had by a physician without the sacrifice of time. A case of this kind has come to our knowledge in which a practitioner from the East, whose friends would deem it a privilege to send him patients, can make for himself a permanent or temporary home in Southern California, under the most attractive circumstances.

Plague at Manila.—Health officers have discovered within the walled city a native with pronounced symptoms of bubonic plague in a house in which two suspicious deaths have occurred. Active steps have been taken to prevent the spread of the disease. Secretary Root, after consultation with Surgeon-General Wyman, has decided to consign to the Marine Hospital Service the conduct of all quarantine matters relating to the army.

Hemorrhage through the Lachrymal Duct.—A case is reported in the recent issue of the *British Medical Journal* of a soldier suffering from Malta fever, who was attacked with severe epistaxis. After the ineffectual application of mild remedies, the nares were securely plugged; blood then appeared in each lower eyelid and trickled down the patient's cheeks, so great was the pressure and so little did the blood possess the power of coagulability.

The London School of Tropical Medicine.—The *British Medical Journal* regards the first season of the London School of Tropical Medicine as very successful. The number of students was twenty-eight; of these, fourteen were medical officers of the colonial service, the remaining fourteen being medical officers of the army and navy, or surgeons to railways, mines, etc., in the tropics. One student came from Germany and another from Belgium.

Dr. Osborne Acquitted.—Dr. Oliver T. Osborne, Professor of Materia Medica and Therapeutics in the Yale Medical School, was tried in New Haven on December 26th, on the charge of unlawfully disinterring a body. The doctor was acquitted. In rendering his decision Judge Studley stated that there was no question, from the evidence presented, that the doctor had been given permission to perform an autopsy upon the body in question.

McGill University.—At the regular monthly meeting of the corporation of McGill University at Montreal, on December 21st, it was decided to establish special courses in connection with the departments of legal medicine and public health and also a post-graduate course in sanitary state

medicine, adequate in both quality and scope to afford upon examination a diploma in public health corresponding to the diploma of public health of England or English universities.

Iowa Insane Asylum Scandals.—The Iowa State Board of Control, which is required by law to investigate the insane asylums in that State, has reported a deplorable condition of affairs in nearly thirty counties. Men and women are in some asylums indiscriminately herded together and no expert care or medical attendance is afforded them. The exposé of these conditions will no doubt bring about legislation abolishing county asylums and compelling the maintenance of insane persons in State institutions.

The Gold Cure Outrivaled.—Paris had hardly recovered from the sensation caused by Professor Metchnikoff's "discovery" of a new elixir of life, when it was announced on December 29th that Dr. Rappalier and Dr. Thiebault had found a "drink cure" in a serum extracted from a horse which (so the lay press states) had been previously alcoholized artificially. This serum, it is claimed, will produce in a patient an unconquerable distaste for alcohol. The Academy of Medicine of Paris has appointed a committee of investigation.

Proportion of Killed to Wounded.—During the three engagements that the forces of Lord Methuen have had in South Africa, the proportion of killed and wounded was approximately 1 to 5.3. This proportion is considerably below the average of previous campaigns, and is almost identical with the loss sustained by the Germans in the Franco-Prussian campaign of 1870-'71. What the proportion of killed and wounded among the Boers may be is not known. The Boers are using the Mauser rifle and the British are provided with the Lee-Metford.

Western Surgical and Gynecological Association.—At a meeting, held at Des Moines, Ia., December 27th and 28th, this association elected the following officers for the ensuing year: President, Dr. O. Beverly Campbell of St. Joseph, Mo.; first vice-president, Dr. A. C. Bernays of St. Louis, Mo.; second vice-president, Dr. J. R. Hollowbush of Rock Island, Ill.; secretary-treasurer, Dr. George H. Simmons of Chicago, Ill. Minneapolis, Minn., was selected as the place for holding the next annual meeting. Chairman of the Committee of Arrangements, Dr. A. W. Abbott.

Venereal Disease in the British Army.—A correspondent of the *Lancet* writes from South Africa: "I am sorry to say that the transports are dropping a lot of sick on arrival here, most reservists; and in some cases specific disease, acquired while in India or elsewhere, when serving with the colors, is very much in evidence. It is brought very much to notice that terrible ravages are made amongst the men by this dreadful disease, and the trouble is greatly accentuated when it becomes absolutely necessary to admit them to a hospital for treatment instead of getting them to the front as soon as possible."

Failure of Lustig's Plague Serum.—News comes from India that Lustig's plague serum has been well tested and the series of cases give no indication that the remedy has any efficacy. In this connection it is interesting to note that Dr. Guido Bacelli, demonstrator of public instruction at Rome, has been directing a series of experiments upon animals in which he claims to have established the fact that intravenous injections of bichlorid of mercury is a specific against bubonic plague. Professor Terni of the University of Massina has sent out to Portugal and Brazil to make known the result of these experiments with a view to adopting the treatment in the human subject.

Testaments and Tobacco.—It is curious how rapidly the medical and scientific side of the campaign against tobacco in all its forms appears to be subsiding. This is amusingly illustrated by the fact that first upon all the lists of comforts for the wounded supplied by the various funds in Great Britain come cigarettes and tobacco and pipes. Even the Red Cross Society has gone so far as to have special brands of cigarettes and makes of pipes prepared and stamped with its sacred emblem. And not a single medical or even clerical voice is raised in protest. Even the clergy are becoming positively friendly to the weed and one cheery evangelical sent to the Red Cross Society a large consignment of *Testaments and tobacco,* in about equal parts.

The Plague at Honolulu.—The transport "Centennial," arriving from Honolulu at San Francisco, December 28th, and the steamship "Aorangi," arriving at Victoria, B. C., the same date, reported the presence of the bubonic plague in the Hawaiian Islands. The outbreak occurred at Honolulu amongst the coolies recently arrived from Japan. Two to five cases terminated fatally. The Board of Health called for $10,000 to fight the plague, and immediately $25,000 was placed at its disposal. A system of fumigation was undertaken, the dead were cremated, and quarantine established. Later advices announce the death of a young girl from the plague, and the occurrence in opposite sections of the city of two cases of the disease in Chinamen. Honolulu is declared by the quarantine authorities an infected port. No ship leaving there can carry a clean bill of health. None of the army transports will be allowed to stop at Honolulu until quarantine is raised.

Death of Sir James Paget.—Sir James Paget, one of the most famous English surgeons of the century, died in London on December 30th. He was eighty-six years old. In 1836 he became a member of the Royal College of Surgeons, and in 1843 was made an honorary Fellow of that institution. Sir James made many contributions to science, among which are the "Pathological Catalogue of the Museum of the College of Sur-

geons," "Report on the Results of the Use of the Microscope," and "Lectures on Surgical Pathology." He contributed frequently to the "Transactions" of the Royal Society, of which he was a Fellow, and of other scientific bodies. In 1875 he was elected President of the Royal College of Surgeons, and from 1884 to 1895 was Vice-Chancellor of the University of London. Many other honors were accorded him during his lifetime. In 1871, in recognition of his humanitarian work and of his many discoveries in surgery, he was created a baronet.

The St. John's Ambulance Brigade.—This "first-aid" organization is responding nobly to calls for volunteers for South Africa. The first call for twenty-three men was responded to early in November. The second call for fifty-three men was responded to in *three days,* and the men embarked at once, and a third call for twenty-eight men was filled in five days. The first detachment was for service on board the Princess of Wales hospital ship, and the last for the Duke of Portland's Hospital. The English profession is keenly interested in St. John's Brigade, as the bulk of the instruction which its members receive is in the form of courses of lectures given by the leading practitioners of the various localities in which branches exist, and this means practically the whole of England. These "first-aid" lectures have been gladly given by medical men, and have proved an excellent means of giving the young people of the community a knowledge of the main principles of hygiene and nursing, and a slight practical conception of what scientific medicine, as distinguished from miracle-working charlatanism, really is.

Scientists Convene at Yale.—Many well-known scientific men, members of ten American associations, arrived at New Haven on December 26th from various parts of the United States. Some of the visitors were from Europe. Among the societies which met were the American Chemical Society, the Association of American Anatomists, the American Physiological Society, the American Psychological Association, the Anthropological Society, and the Society of College Gymnastic Directors. Among the less severely scientific papers presented was one by Dr. Jay W. Seaver of the Yale Gymnasium, on a comparison in anthropometry between the types of three women's colleges. Dr. Seaver announced that there are two distinct types of the American college girl, that of the East having the greater height and a "cutter" build of head and that of the West having much the greater girth of chest and larger lung capacity, with a "schooner" build of cranium. Dr. Seaver's paper elicited warm discussion, through which the writer's hopelessly soulless and unemotional temperament was made evident. Two very important papers from the medical man's viewpoint were read by Professors T. D. Aldrich of Detroit and Scripture of Yale. The former described a new anesthetic, chlorentone, a compound from chloroform and acetone, which can be administered internally. Professor Scripture reported progress in producing anesthesia by electricity. It is possible by this invention in its present stage to deaden sense so that pins may be inserted in the flesh without producing pain. The current has not yet been made effective in the presence of moisture, so as to make it available in dentistry.

Obituary.—In addition to the deaths of Sir James Paget and of Dr. Coues, several others have to be recorded. Dr. William B. Canfield, a resident of Baltimore, died in Roosevelt Hospital, in New York City, on December 26th, of a fractured skull, which injury he sustained by slipping on the sidewalk and striking his head against the curbstone. Dr. Canfield was forty-four years old.—Dr. Francis Bonynge died in Chicago on December 26th. He was wounded by the Boers in the famous Jameson raid, and served three months in Holloway jail because of his part in the affair.—Dr. Wickliffe Smith, surgeon of the 161st Indiana Regiment, was killed on December 29th, near Indianapolis, on account of the cold weather. He was muffled so that he did not hear an approaching train, and was struck and instantly killed. Dr. Smith was well known and greatly liked throughout Indiana.—Dr. Thomas C. O'Callaghan, one of the oldest physicians of Jersey City, died suddenly from apoplexy while visiting a patient on December 27th. He was born in Ireland in 1831. He was graduated from the New York College of Physicians and Surgeons in 1860.—The death of Dr. Frank Grover, a well-known physician of Newark, New Jersey, occurred on December 30th, under nearly similar circumstances. Dr. Grover was stricken with apoplexy while visiting a patient. He was removed to his home, where he died shortly afterward. He was fifty-five years old.—This very unusual obituary list closes with a notice of the death of Dr. Irwin R. Fisher, a prominent physician of Harlingen, New Jersey, who was found dead in his bed on the morning of December 31st. Death, which was due to natural causes, was ascribed by the county physician to "heart disease"—always a convenient diagnosis.

Influence of Lime on Malarious Soil.—M. Grellet, in a recent communication to the French Academy of Medicine, observes that up to the year 1840 malaria was rife among the inhabitants of Châtillon-sur-Loing; after that date it disappeared completely. Except in one particular no difference has been made in the agricultural methods employed, no drainage or sanitary works had been carried out, and no change had been made in the mode of living. Between 1824 and 1840 lime was applied to the soil for purely agricultural purposes, and by the time the whole plateau had been thus treated malaria had disappeared. Grellet maintains that the geographical distribution of malaria supports his contention that malaria is not found where the soil contains a sufficient quantity of lime. Lower Egypt, for instance, which, with its marshes, high

temperature, etc., might be expected to prove a hotbed of malaria, owes its general exemption to the relatively large amount of lime in the Nile water and mud. Still more striking are the differences observed in certain districts in France. La Beauce, on the right bank of the Loire, is free from malaria; across the river, la Sologne, on clay and gravel, suffers severely. The north (calcareous) coast of France is free from fever; the west coast, south of the Loire, is malarious—its soil is clay. No accurate observations have been made as yet on the quantity of lime necessary to kill the malaria parasite. At Châtillon-sur-Loing about 10 tons per acre were employed. At Lapeyrouse the amount used on granite soils and on clay were respectively about 2½ and 3½ tons per acre. M. Grellet makes no mention of the mosquitoes at Châtillon. The value of a process which at once checks malaria and improves the soil is obvious.—*British Medical Journal.*

Our Native Drug Plants.—The Secretary of Agriculture, Hon. James Wilson, has embraced the following paragraph in his annual report, which is of interest to the medical profession:

"The collection of native drug plants in the United States, considered from a purely financial standpoint, aside from medical and humanitarian aspects, involves the expenditure of millions of dollars annually. The commercial extermination of some of the most useful species is already threatened, and doubtless others would be found in the same conditions were the facts known. The price of one native plant, ginsing, our exports of which average more than a million dollars annually, has more than quadrupled in the past thirty years, so that its cultivation, as urged four years ago by this department, has now become profitable. It is clear from this and many similar cases that the native drug industry is capable of either decline or improvement, according to the way in which we handle it.

"The Pan-American Medical Congress has recently submitted to me a proposition to co-operate with this department in a technical and statistical investigation and classification of our native drug plants. By accepting this proposal we shall secure, in a research of which we have long felt the need, the cordial assistance and support of an influential association of learned physicians; we shall encourage each of the other American nations, all of which are represented in the Pan-American Medical Congress, to proceed with a similar investigation of their own medical flora; we shall furnish a basis for the remunerative employment of much land and many people, and we shall stimulate the great growth and growing trade in drugs between the countries of North and South America. I urge the appropriation of $10,000 to enable this department to co-operate in this investigation."

Death of Dr. Elliot Coues.—Dr. Elliot Coues died in Johns Hopkins Hospital from the effects of an operation on December 26th. From his father, Samuel Elliot Coues, who was a noted scientific man, he received his liking for natural history, which resulted in his development as an ornithologist. He was graduated from the Academic Department of the Columbian University in 1861 and from that institution's School of Medicine in 1863. Later his alma mater gave him the degrees of A.M. and Ph.D. He became assistant surgeon in the United States army in 1863 and held that rank until his resignation in 1881. Wherever his army duties called him he made exhaustive studies of the fauna and flora of the region, and he often set down the results of his investigations in valuable scientific papers. He held the chair of anatomy in the National Medical College from 1877 to 1883, when he was appointed professor of biology in the Virginia Agricultural and Mechanical College. Soon after his resignation from the army he began to investigate by means of scientific methods the phenomena of spiritualism and telepathy, with the result that he became a theosophist and a prominent associate of Madame Blavatsky. He was a member of the British Society of Psychical Research. In later years, however, he lost much of his interest in occult studies, probably because of his tardy apprehension of the emptiness and the trickery inherent in Madame Blavatsky's movement. One of the most important of his many literary labors was the contribution, during seven years, to the "Century Dictionary" of more than 40,000 words and definitions in general biology, comparative anatomy, and all branches of zoology. The range of his literary life was very great. He was the author of thirty-nine volumes, and he contributed over 1000 articles to various magazines and periodicals. He served six different scientific journals in editorial capacities, and his name was on the rolls of more than fifty American and foreign scientific societies. Dr. Coues was fifty-seven years old.

Medical Necrology During 1899.—Among the distinguished medical men who have passed away during the past year the following are worthy of special mention in closing up the medical accounts at the end of the year. Joseph Coates, professor of pathology at the University of Edinburgh, died January 24th. He was one of the men who twenty-five years ago realized that the scientific foundation of medicine was pathology; that if medicine was to advance in England as it had done in Germany, it must be by the cultivation of pathology. February 10th, Professor Laboulbene, professor of the history of medicine for twenty years at the University of Paris. When younger he was known especially for his work in pathology and entomology. February 21st, Professor William Rutherford, professor of physiology at the University of Edinburgh. February 25th, Sir John Struthers, emeritus professor of anatomy at the University of Aberdeen. March 10th, Sir Douglas Galton, M.D. May 27th, Professor Charpentier of the French Academy of Medicine. June 13th, Lawson Tait. Mr. Tait's death is the greatest loss medicine has

suffered, in English-speaking countries, during the year. His ground-breaking work in aseptic surgery, in tubal pregnancy, in ovariotomy, and in the surgery of the gall-bladder stamps him as the most original practical surgeon of our generation. July 31st, Dr. Daniel Garrison Brinton. Dr. Brinton served as a surgeon during the Civil War, though of late years he had acquired a worldwide reputation as an archeologist and ethnologist. August 20th, George A. Hendricks, professor of anatomy in the University of Minnesota, at the age of forty-nine. September 30th, Surgeon-General Sir Charles A. Gordon, K.C.B., of the British army. His work on enteric fever in India gave him high rank as a medical observer and hygienist. For his courageous and unselfish services during the siege of Paris, at which city he was a medical commissioner for the British government at that trying time, the cross of the Legion of Honor was conferred upon him. December 26th, Elliot Coues of Baltimore, and December 30th, Sir James Paget of London. The last two have more extended mention elsewhere in this issue.

Medical News from Seat of War.—Much comment is being made upon the contrast between the noble and friendly action of the American ladies in charge of the "Maine" and the resolution of "Senator Billy" Mason, thankfulness being expressed that it is the former which really represent the bulk of intelligent opinion in the State. The state of affairs in the Commissariat Department is not entirely satisfactory. Complaints continue to pour in, in private home letters, from enlisted men, of the wretched fare upon the transports en route for Africa, especially in regard to the meat, both salt and canned, the former of which was frequently condemned by the medical officers and the latter alleged to be most uninviting. One private alleges that he lived upon canned salmon and marmalade for ten days, paying out of his own pocket for them, and all writers agree that a large share of the men's pocket-money was spent for food, as high as two dollars being said to have been offered for a loaf of bread. Of course some of this must probably be discounted as due to Mr. Atkins's natural propensity to grumble at his food, especially when his appetite is "sicklied o'er" by *mal de mer*, but there is too much smoke of this sort not to have some real fire at the bottom of it. The English Admiralty has long had an unenviable reputation in this respect, since the scandals of the Crimea in fact, not from corruption or even incompetence in the ordinary sense, but from the paralyzing effects of its abject worship of red tape. A few of the complaints, however, are still more grave and involve the military authorities, as troops on the Orange River complain that, in spite of the presence of abundant stores of provisions, the actual rations served out to the men in the field are most scanty. Still, the defect cannot be very serious or widespread, as the health and general condition of the men at the front is universally reported as excellent. It is, however, a possibility to be borne in mind that the great fatigue complained of by the troops in and after an action, and which is declared an important factor in accounting for the large number of prisoners taken, may be dependent in some measure upon these alleged inadequacies of the commissariat. Extensive arrangements are being made for the reception of wounded and others invalided now at Netley Hospital, and specially fitted trains are provided for their conveyance from the docks directly to the hospital. The "volunteer" movement among general hospitals, sanatoria, and convalescent homes continues to spread, and offers of free accommodation for military invalids are coming in almost daily. One of the latest came from the London County Council, which, upon the urgent recommendation of its Parks Committee, has unanimously decided to turn the beautiful private mansion and park-like grounds at Golder's Hill, recently acquired as an addition to Hampstead Heath, into a temporary convalescent home for invalided soldiers. The expense of fitting and maintenance is to be borne by a committee of public-spirited residents of Hampstead, headed by several members of our own profession. The drain upon the insufficient army medical staff is again beginning to tell, and more civilian medical men are about to be enrolled to fill the gap. Professor Ogston of Aberdeen, whose able and outspoken criticism, at the Portsmouth British Medical Association, of the neglect of the Army Medical Department by the War Office, is going out to South Africa as an interested spectator; not, we need hardly say, in an official capacity or at the expense of the irate and offended War Office, although there is an apparently authoritative rumor abroad that he goes by request of the Queen.

CORRESPONDENCE

OUR LONDON LETTER.

[From Our Special Correspondent.]

BORIC ACID AND FORMALIN AS FOOD PRESERVATIVES—COW INSPECTION IN LONDON—TUBERCULOSIS CONGRESS—RESEARCH LABORATORIES—RISE IN LONDON DEATH-RATE—COMPLICACATIONS AT LEICESTER—MEDICAL ARRANGEMENTS IN SOUTH AFRICA—MEDICAL MEN AND THE ROYAL SOCIETY—CANCER LABORATORY DONATION — INSANITARY FACTORIES — CONSUMPTION IN HOUSES—HEART MURMURS—MILLIONS FOR DRAINAGE—MODEL LODGING-HOUSES.

LONDON, December 23, 1899.

Just as the departmental committee is holding its sessions upon the question of the use of preservatives in foods, and public attention is being directed toward the subject, a most timely paper by Dr. A. G. Faulerton, bacteriologist and lecturer upon hygiene at the Middlesex Hospital, has appeared in the *Lancet*. This

is the report of an elaborate original investigation into the effects of formalin, boracic and salicylic acids upon the general health, the processes of digestion, and the solubility of the food treated with them. He comes to the reassuring conclusion that in the amounts usually present neither formalin nor boracic acid have any appreciable effect upon either the general system or the digestion, except possibly in the case of delicate children or invalids who are on an exclusive diet of the food. Their use should, however, be strictly regulated, only such as are approved by the Local Government Board being permitted at all, and these in proportions not to exceed a specified maximum. Lastly, all "treated" or "preserved" foods should be clearly labeled or otherwise indicated as such. With these conclusions most of us will agree, especially as to the advisability of having rigid examinations of food and condemnation of all specimens containing more than the proportion allowed. But as to whether the labeling of the milk, butter or cheese as "treated" could ever be anything more than a "counsel of perfection" seems seriously doubtful. Such a label in the present state of public sentiment would simply condemn the goods at sight and ruin their sale. Permission to use on these terms is tantamount to an absolute prohibition and would prove practically as difficult of regulation and enforcement. We are fully justified in the radical step on the ground that such additions open the way for the covering up of all sorts of carelessness and uncleanliness in the original handling and collection of milk and cream.

The Public Health Committee of the London County Council report that their inspectors have examined 5144 cows in London dairies and found 680 or 13 per cent. presenting clinical symptoms of tuberculosis. They recommend that dairy cattle in the London cowsheds should be examined regularly at least every three months by veterinary surgeons, and suspected cows at more frequent intervals. This inspection will, however, never be complete or really effective until it includes the systematic use of the tubercular test.

The National Association for the Prevention of Consumption, since its inauguration last spring under the auspices of the Prince of Wales, has spread rapidly until it now has branches in almost every part of England. Eminent members of the medical profession have been most active in promoting its interests and it is now proposed to hold a congress in London in furtherance of its aims in the spring of 1900. The Prince of Wales has accepted the presidency at the gathering and the council of the association, of which Sir Wm. Broadhurst is chairman, are working on the liminary arrangements.

The research movement is steadily spreading in London. Following close upon the establishment of a cancer laboratory at the Middlesex Hospital, the Governors of the Westminster Hospital have announced the equipment of a clinical research laboratory with modern appliances and a "pure" pathologist at its head, upon the lines, as they themselves complacently remark, which have proved so successful at Johns Hopkins. Congratulations are pouring in upon them from all sides and we must all cordially unite in these but cannot forbear a friendly comment of surprise upon one feature of the scheme. The Governors take special pains to announce that the superintendent is to be a professed pathologist and freed from dependence upon general practise and that hence his salary should be on a proportionate scale, wherefore he is to receive the sum of $1,250 a year with certain fees from lectures in the medical school at the hospital. It is to be hoped that these lecture fees are distinctly liberal, else it would hardly appear to transatlantic eyes as if the professed pathologist was as completely freed from dependence upon practise or other sources of income as might be desired.

The sudden change in the hitherto mild weather to dense fog, followed by raw frosts and light snow, has had a striking effect upon the London death-rate, sending the unusually low rate of a week ago of 17.5 per 1000 sharply up to 22.4 per 1000. The increase was chiefly in deaths from diseases of the respiratory organs which leaped from 430 to 548, or 112 above the corrected average for this week of the year. A similar effect has been produced among our cousins at the Zoological, no less than two out of the three surviving chimpanzees having joined the majority by the way of bronchopneumonia.

There is still trouble at Leicester. When the Guardians made their submission to the Court Mr. Justice assumed a most astute attitude of reserve and declined to dismiss the charge of contempt against them until he was assured that their compliance was genuine and the vaccination-officer appointed a suitable man. And his suspicions have been abundantly justified already, for the Local Government Board have declined to confirm the officer on the ground that he had been fined some years before for failing to have his children vaccinated and was even now a defaulter under the Act, as his youngest child, although three years of age, was still unvaccinated. They had also found that he did not propose to prosecute defaulters except *with the concurrence of the Guardians,* and hence his appointment was practically a farce. Wherefore the Guardians are advertising for another candidate and are hastening to submit their apologies to the incensed High Court.

The medical news from South Africa for the past week has been as scanty as the military, owing probably to the strict censorship exercised over all the telegrams by the authorities. So far as it goes, however, it is most satisfactory. The wounded are doing wonderfully well; little dysentery or typhoid and no crowding whatever in the hospitals. The only serious anxiety is as to the condition of the troops and civilians shut up in Ladysmith and Kimberly, especially

the former, where, as intimated in a former letter, typhoid is a regular seasonal occurrence to a greater or less degree.

The profession is again strongly and most creditably represented upon the blue-ribbon list of English science, the staff of the Royal Society. Lord Lister has just been elected to succeed himself as President. Sir Michael Foster is again Hon. Secretary, while upon the Council are Profs. Herdman and Halliburton of physiological and pathological fame, and Sir Samuel Wilks, late President of the Royal College of Physicians.

The public is getting decidedly interested in cancer. Only three days ago the Governors of the Middlesex Hospital announced to the press their intention, which they had been maturing for some months, of opening a cancer-research laboratory in connection with their new cancer wing. They mentioned the amounts to be expended upon equipment and maintenance, remarking merely that subscriptions would probably have to be asked for. Within forty-eight hours they received in one donation from Mr. Arthur W. Davis the sum of $5,000 sufficient to cover running expenses upon the scale contemplated, for nearly two years.

Even in England sanitary legislation gets "hung up" sometimes. Only this week a delegation of cotton-cloth workers representing 80,000 operatives called upon Sir Kenelm Digby at the Home Office to complain of the insanitary condition of their factories. The artificial moisture required in the weaving-sheds is kept up by sprays of impure water, the percentage of carbon dioxid created in the processes is far in excess of the legal maximum, and the rooms are excessively overheated—the only such in England if this be the case. An order in court prohibiting these abuses was issued twenty months ago, but no effect whatever had been produced yet. Sir Kenelm Digby replied that it took time to put such orders in force—which was tolerably obvious—but that the office would at once move in the matter.

Sir Richard Thorne-Thorne, in his address upon "The Prevention of Tuberculosis," before the London Medical Society, summed up his view of the method of spread of tuberculosis in the sentence, "Consumption runs in houses—not in families." He called attention to the fact, too easily overlooked in these bacillophobe days, that the chief factor in the huge fifty per cent. reduction of the tubercular death-rate had been drainage of the subsoil and ventilation of houses, and that two-thirds of it had been effected before the bacillus was discovered.

An interesting case of heart murmur was demonstrated by Sir William Broadbent, at his consultation at the Polyclinic this week. This was the extracardial "rub," due to the friction of a small thickened patch upon the pericardium—a "pericardial corn," as Sir William graphically described it. These patches are quite common, occur without any inflammatory process, and last for years, or even a lifetime without changing or giving rise to any symptoms whatever except the murmur. Their chief distinguishing character is that the murmur disappears or diminishes under firm pressure. The lecturer stated that many young men are needlessly rejected at army entrance-examinations on account of these soft systolic murmurs, which have really no practical morbid or prognostic significance.

The immensity of the sanitary problems of London may be imagined from the action of the progressive London County Council, or "L. C. C." as it is always spoken of, this week, when it was decided to expend upon a main drainage scheme alone the sum of $7,500,000, and this is only the first instalment upon a project estimated to ultimately require some $15,000,000. But the design is as superb as its cost, for it achieves the complete freeing of the Thames from both sewage and surface water, and the delivery of these by great conduits into the estuary several miles below the city. Even this, however, will only solve the problem temporarily, on account of the rapid extension of the river suburbs down the shores of the estuary, and the undesirable effects of these enormous quantities of sewage upon the lower reaches of the river, which is already beginning to be noticeable. Sooner or later the problem of the direct destruction or purification of the sewage either by chemical, combustive, or "natural" farm methods will have to be faced.

An experiment which will be watched with great interest by all sanitarians was resolved on this week by the London County Council. This is the erection of a model lodging-house upon the Rowton plan, as a means of relieving one form of London's overcrowding. These "Poor Man's Hotels," as they term themselves, are the admirable device of a philanthropic peer, Lord Rowton, and are huge well-warmed and lighted buildings where, for the modest sum of 12½ cents a man can secure not only a tiny cubicle and cot for the night, but a bath, a shave, the use of a reading-room and smoking-room. A dining-room and series of cooking-ranges, with utensils, are also free, and at a buttery portions of food of all sorts may be bought for from 1 to 6 cents, and then cooked by the "guests" themselves. There are now three of these in London.

SOCIETY PROCEEDINGS.

THE NEW YORK ACADEMY OF MEDICINE—SECTION ON SURGERY.

Stated Meeting, Held December 11, 1899.

Charles N. Dowd, M.D., Chairman.

A Case of Prostatectomy was presented by Dr. Alex. B. Johnson. The patient, sixty years old, a silk weaver, suffered first from difficulties of urination some five years ago. Then his urination

became painful and frequent, especially at night. During the last few weeks before his admission to Roosevelt Hospital in October, 1899, he had been compelled to pass his water ever ten minutes. He had been catheterized frequently without affording him very much relief. He had never used the catheter himself. His peripheral arteries were atheromatous; there was no cardiac lesion present. His urine was normal in quantity, fetid in odor, but not ammoniacal, contained pus, but no casts. There were five ounces of residual urine. An enlarged prostate, apparently symmetrical, could be felt per rectum. When the patient first came into the hospital his pulse was 120. There was a constant desire to urinate, which was not relieved by catheterization, and despite the fact that he was catheterized every couple of hours for five days his condition was not improved. He was not only ready then but anxious for any operation that promised to give him relief.

Under ether anesthesia an incision two inches long was made at the median line just above the pubis. The prostatic collar could be felt very plainly projecting into the bladder and there was a large prominence behind it. A transverse incision was made just in front of the anus and then, by blunt dissection, mainly with the finger the enlarged prostate was easily shelled out. The median lobe came away with the torn mucous membrane of the membranous portion of the urethra. The median suprapubic incision was closed, a large catheter was passed in the wound in the perineum, and the latter packed. There was not any shock, nor pain after the operation, nor symptoms of even slight septic infection. The urine drained through the packing, which was of sterile gauze, and had to be changed frequently for the first couple of days. For the first twenty-four hours the discharge was somewhat better. After forty-eight hours iodoform gauze was substituted in the dressings, and a gradually decreasing amount was used. The catheter was allowed to remain in for the first eight days. After this a 32 French sound was passed.

His first voluntary urination took place on the eighteenth day. Faradic electricity was used in order to increase the muscular tone of the overstretched bladder. It was applied by means of a metal electrode inserted into the rectum and a sponge electrode over the pubis, and proved very effective. There was a gradual increase in strength of the stream and in the amount of urine passed by the urethra, with a decrease in the amount of urine passed by the perineal sinus.

At the present time, two months after the operation, he weighs twenty-five pounds more than he did before it, is able to retain his urine for long intervals, urinates freely at will, and his urine is normal. There is still a slight sinus in the perineum, through which a certain amount of urine trickles at times, but it is visibly growing less and less in amount from day to day, and the sinus is rapidly closing up. The impression obtained from an operation like this is that it is much easier to do a prostatectomy than it has usually been thought. The speaker said that if he were to do another operation of the same kind there is one improvement in technic that he should endeavor to put into practice. He would not tear through the membranous urethra, but would shave the prostrate from along side of it, after shelling out the lateral lobes. This would perhaps cause more hemorrhage at the time of the operation, but it does not seem that this would be difficult to control, and convalescence would certainly be very much shortened by this procedure.

Prostatectomy and Urethral Resection.—Dr. Eugene Fuller presented two cases of prostatectomy and one case of resection of the urethra. The first patient, a man sixty years of age, had followed the sea for many years. He had all the prostatic symptoms. He had been under treatment at a metropolitan hospital, where perineal drainage had been tried, but absolutely no attempt was made to do anything for the prostatic condition. The result was a urinary fistula in the perineum, but no relief of his symptoms. The patient had atony of the bladder, his urine was extremely foul, and his symptoms were so severe that he was ready to undergo any operation which promised relief. Prostatectomy was surely indicated.

An attempt was made to do the prostatectomy through a suprapubic incision, but the peritoneum was found to be so involved in chronic inflammatory adhesions that it was impossible to expose the bladder sufficiently to make the ordinary incision. The transverse incision suggested by Trendelenburg might have been tried, but it so often proves the occasion of bulging in this region afterward that it was not deemed advisable. The operation had to be performed through the perineum. Operative procedures were much complicated by the fact that the old sinus had to be cut out during the course of the operation. The prostate was so large that it was hard to deliver through the perineum, and it was only when one of the heavy straight forceps usually used in peritoneal work was employed that the prostate could be grasped and brought out. No sounds were used after the operation. They are of no benefit as far as can be seen and they cause traumatism that should be avoided if possible. A resection of the urethra was made after the removal of the prostate, and a catheter was allowed to remain in for some time. At the present time the patient is able to pass a good forcible stream of perfectly normal urine, has none of his old symptoms, and can retain his urine for reasonably long intervals. Dr. Fuller then showed a second case in which there had been inflammatory thickening all around the prostate from the presence of gonorrhea, prostatitis, seminal vesiculitis, and other complications that had caused a massing together of all the tissues in the neighborhood of the prostate. The bladder was atonied—a quart of water might be injected into it without causing a reaction for its expulsion. A hemorrhage into such a bladder would be very dangerous, and no packing around the catheter would suffice to stop it.

The prostate was removed through a suprapubic incision, and a second opening was made through the perineum for drainage. Where atony of the bladder has existed for some time the only thing that gives any assurance of recovery from vesical symptoms is to set the bladder absolutely at rest for a time. Otherwise bothersome recurrence of symptoms will surely take place.

Resection of Urethra.—Dr. Fuller's third patient suffered from stricture through which it was extremely difficult to pass a catheter, and it had finally become practically impossible after a number of false openings had been made. Instead of spending half to three-quarters of an hour trying to pass a sound, it seemed more advisable not to keep the weakened patient for a long time under ether, but to do the operation without a guide. The urethra was resected, the ends carefully sutured together, and at the present time the patient is able to pass a perfectly good stream. No instruments were used to dilate the urethra after the operation, and it does not seem advisable at any time to use them. They always do more harm than good.

Prostatectomy at Seventy-one Years of Age.—Dr. Forbes Hawkes presented a patient, seventy-one years of age, who had had two attacks of retention of urine during the past year, the last one being a very severe one. His prostate proved to be very much enlarged and his urethra was over twelve inches long. Sixteen ounces of urine were removed after considerable difficulty. The patient was very willing to undergo a radical operation because he had suffered a good deal and feared the result of another attack of retention. His inguinal glands were enlarged, and it seemed as though on palpation through the rectum some enlarged retroperitoneal glands could be felt. The case looked like one of carcinoma of the bladder, and an unfavorable prognosis was given.

A suprapubic incision was made and then an incision through the vesical walls over the enlarged lateral lobes and prostate. These were rather easily shelled out. The median prostatic lobe, which was also enlarged, was then worked out through the space furnished by the previous removal of lateral tissue. Into the pouches that were left drainage-tubes were put down, in order to carry off any accumulation of blood. The catheter was retained for some days. Everything healed very kindly and the patient's present condition two months after the operation is excellent. He goes to bed at nine and does not have to get up until seven. His control of his urine is practically perfect. When he sneezes a drop or two is sometimes forced from the urethra.

In this case the enlargement of the prostate was much more into the bladder than downward into the rectum. By palpation in the rectum the prostate did not seem much enlarged, and seemed to be regular and symmetrical. It proved, on removal, to be very irregular and nodular, the enlarged lateral lobes overlying the median lobes and pressing against one another. The tumors after the enucleation weighed five ounces.

Floating Cartilage of Knee-joint.—Dr. B. Farquhar Curtis presented a patient showing the result of an operation for the removal of such a cartilage. The patient, a young man, had had no symptoms until June, when as the result of dancing he suffered from traumatic synovitis, with effusion into the joint. In September, from even a slighter cause, he had another such an attack. An irregular body was found projecting beneath the skin at one side of the knee and was cut down upon and removed. It proved to be a bit of purely hyaline cartilage attached by a pedicle to the upper part of the capsule of the joint. The healing was rapid and at the present time there seems every hope that there will be no further attacks.

Dr. Lloyd presented a case in which the patient, after jumping, had been compelled to limp, and noticed a clicking in the joint. He felt something movable there. The joint was opened and four bits of floating cartilage were found. One about the size of an almond kernel, and three others the size of peas. On the tenth day the splint was taken off and the patient had good motion. There is still a little pull on the ligamentum patellæ, but motion is good and there has been no recurrence of any symptoms.

Cystoscope of Nitze and Caspar.—Dr. Willy Meyer demonstrated the ingenuity especially of Nitze's instrument, showing how the loop for seizing intravesical tumors was manipulated, and how it might readily be changed into an electric cautery. Cauterization of these tumors is possible notwithstanding the presence of water in the bladder, because the loop of wire buries itself in the tissues of the tumor, and so is protected for the moment from contact with the water, and the consequent cooling.

With this instrument Dr. Nitze has operated on thirty patients. They were operated on as office cases, and did not require being put to bed. Frequently they were allowed to go to the theater or to a dinner-party the same evening. The tumors were removed piecemeal, as many as fifteen sittings being required for some of them. Death did not occur and there were no alarming symptoms. At times there was severe hemorrhage, and the clots had to be washed out with an aspirating instrument. The major part of the tumors removed were papillomata, and proved to be benign. The cases were followed for a year and a half afterward, without a single recurrence as far as could be ascertained. Dr. Nitze differs from Rokitansky with reference to the character of these tumors, and considers that many that used to be considered malignant are really benign and when removed will not return.

Bottini Prostatic Cauterizer.—Dr. Meyer demonstrated this instrument and showed how readily it could be employed. He has used Bottini's method of treating prostatic hypertrophy in twenty-three patients during this last year and a half, and has had no recurrences. Bottini himself, whose experience extends over twenty-four years, says he has never seen any recurrences. Operations for prostatic trouble so far have either

been offensively mutilating, or have been so severe that patients have refused operation until pyelonephritis or other serious complications made even simple operations very grave. It would seem that this comparatively easy procedure of Bottini's will tempt patients to allow themselves to be operated on sooner and so anticipate the severer troubles. This would seem to be particularly the field for Bottini's operation. With regard to the cauterizator there is one case in particular reported by Bottini, which is very striking. A boy of sixteen, who had been incontinent of urine for some fourteen years, was completely cured by a single cauterization of the neck of the bladder.

It would seem that there is a field for it in certain cases of chronic gonorrheal prostatitis where deep injections and massage, and every other mode of treatment has failed.

In discussion, Dr. Bolton Bangs said that the ingenuity of Nitze, as displayed in the cystoscope that he has given the profession, is certainly to be admired. It is undoubtedly a welcome addition to the armamentarium of the surgeon, but it is very doubtful if it will accomplish all that its inventor hopes for. Tumors of the bladder are, unfortunately, oftener malignant than benign. Perhaps the operating cystoscope will be of use for cases of recurrence, when patients will be more ready to submit to this form of intervention than to operation. As to the Bottini cauterizator, he said that he had not had any experience with it. The Bottini incision has certainly come to stay, but it is necessary to select the cases in which it will surely be useful. In some cases, notwithstanding long and broad and deep incisions, it had failed to give anything more than temporary relief. In soft prostatic enlargement, where the glandular elements predominate, it seems to do good. But in the fibroid enlargement of the prostate it has been less successful.

Dr. Samuel Alexander said that there are two questions which must be considered in all treatment of enlargement of the prostate: First, what are the causes of the vesical and urinary symptoms, and, secondly, what operation will give relief? There is primarily a set of permanent obstructions. These are due to overgrowth of the prostatic gland itself, and of accessory prostates. And then there is a secondary temporary obstruction due to edema of the prostate and venous stasis within the gland. In any case it is the disturbance by the tumor of the muscle fibers of the bladder which prevents the proper emptying of that viscus. Tumors, especially of the middle lobe of the prostate and of the accessory prostatic glands existing beneath the mucous membrane of the trigone, cause this disturbance of muscular action. Hence, atony of the bladder develops from overstretching in the hopeless effort to empty the bladder under such unfavorable circumstances. The only operation that will remedy this interference with muscular action is the removal of the enlarged prostate that causes it. Bottini's operation only removes the obstruction; it does not allow the vesical fibers to resume their want of function. Besides this, it does not drain the bladder and so give it the time for an absolute rest, which is the only thing that can restore it to its normal condition. Bottini's operation gives but temporary relief, and then leaves the tissues in an extremely unfavorable condition for any radical operation to be undertaken afterward. It would be too bad if the desire for novelty should replace scientific judgment in so serious a matter as this, and a protest should be raised against the present movement in favor of Bottini's methods.

Dr. Otis thought that Dr. Nitze's very ingenious instrument will very probably never be of any practical service except to aid in the catheterization of the ureters. It requires too much skill in itself, and the opening of the bladder has become comparatively so safe an operation in our day that it is evidently more advisable to do the operation under the direction of the eye and hand than with the doubtful operating cystoscope.

Dr. Willy Meyer, in closing, said that Dr. Nitze claims that his method should be used only for benign tumors, which, he says, are more frequent in the bladder than is usually thought. It is not probable that Bottini's method will do away with all necessity for operative work on the prostate; still the hope may be cherished that patients who are developing symptoms of prostatic trouble will be persuaded sooner to accept this method for relief of their symptoms than they would the older and more severe operations.

HARVARD MEDICAL SOCIETY OF NEW YORK CITY.

Stated Meeting, Held November 25, 1899.

William B. Coley, M.D., Vice-President, in the Chair.

New Electro-Static Current.—Dr. William James Morton read a paper on this subject with considerations of its place in electro-therapeutics. He said that the history of electricity in medicine in this country does not go back very far. In 1881 he brought the first influence electric machine to this country from France. At that time Dr. Knight had a small static electric apparatus which was the only one of the kind in New York City. Now, of course, the number of static machines in use runs up into the thousands. Fashionable drugs come and go, but static electricity has continued to gain in popularity until now it is one of the most generally used of therapeutic agents.

Effects of Static Electricity.—The long spark or the shorter finer one producing the prickling sensation is used. The therapeutic advantage of the spark comes from its percussive effect. This effect is produced not alone on the surface, but also on the tissues beneath the skin. The molecular perturbation produced in muscular tissue causes a decided reaction in normal metabolism. Besides this there is now no doubt that electricity

applied to peripheral nerves acts upon the nerve centers. Hodges' observations show that peripheral excitation produces changes in nerve-cells, causing decrease in the size of their nuclei and variations in the appearance of their protoplasm.

Besides the ordinary static electricity with discontinuous sparks there are two forms of current electricity from the static machine which may be employed. In the one the patient on an insulated stool receives the current from a static machine until fully charged. Surplus current then either passes off into the air or may be taken from the patient with the production of sparks just as if he were touched by one pole of the machine when in contact with the other. The effect of the current of electricity passing into him is essentially tonic in action and while stimulating is not in any sense irritative. On the contrary there is a distinct soothing effect produced especially on excited nerve-tissue and this with its stimulating action has an excellent effect on chronic neurasthenic and other neurotic conditions. Painful affections that are not acutely so but long enduring and productive of a great deal of annoyance are especially benefited by frequent treatments of this kind.

There is a second form of static current that is still more interesting, because more effective and especially more soothing and anesthetic than the preceding one. In taking this the patient is seated upon the insulated stool as before and one of the poles of the static machine is grounded, an electrode attached to the other pole being placed on the patient wherever the soothing and stimulating properties of this current are required. In this current the patient forms a part of the displacement circuit of Clarke Maxwell, or, to put it in what is now a more popular form of expression, the patient is the sending pole of a Marconi wireless telegraphic circuit.

Spark-Gap Current.—The electric wave or spark-gap current is able to produce physiological tetanus of muscles with the least pain possible under the circumstances. Not only that, but its absolute effect is greater than that of the static current. Experiments have shown that a muscle can be made to lift a dumbbell without pain by exciting it with this current, when to produce the same effect with the other current will cause considerable pain. This spark-gap current has a general and local effect. In general it is tonic in quality, accelerates combustion and oxidation in the tissues, and this improves metabolism and hastens excretion. D'Arsonval found that under its use there was produced in the tissues more water, more carbon dioxid, and more urea than under ordinary circumstances. The salient fact in its use is this notable increase of metabolism.

Therapeutic Applications; Locomotor Ataxia.—So much has been claimed theoretically for electricity that only practical results really deserve consideration. In progressive locomotor ataxia of the first and second degree the use of the static machine will arrest the progress of the disease, improve the co-ordination, lessen the bladder symptoms, decrease the pain, diminish the number of crises, and relieve sexual and urinary symptoms. There is distinct improvement from the very beginning of the treatment. In cases where a spark was not felt at the beginning of the treatment it could be distinctly felt at the end of four minutes, while at the end of a quarter of an hour sensation had returned to such a degree that the same length of spark could be no longer tolerated. As the sensations improve in locomotor ataxia the co-ordination becomes better. Patients themselves are more satisfied with the treatment because of its effect upon their pains as well as upon their sexual potency, and also for the confidence it gives them in their power of co-ordination.

Here is a patient who has suffered for nearly ten years from tabes, with lightning pains which were so severe and so frequent as to make life almost unbearable. His co-ordination was so much affected that he could walk around only with the aid of two canes. His confidence in himself even under these circumstances was so slight that he scarcely ventured to go on crowded streets or to cross the street when vehicles were approaching. His general condition was very much debilitated by his frequently recurring pains and by various visceral crises. As can be seen at the present time, he is able to walk well with but one cane, or can even dispense with that and still walk reasonably well. He has regained confidence in himself and is able to go about the streets without fear. He goes up and down stairs without difficulty, and his old sensation of always walking on carpet has almost completely disappeared. He is able to turn rapidly, and can guide himself confidently through a crowd. He has been so much improved by three months' treatment with static electricity that he now considers himself in very tolerable condition. He is very proud and very satisfied with the results that have been secured. The case strikingly illustrates how much can be done for tabes even in its most seemingly hopeless condition by careful treatment with this method.

Rheumatoid Arthritis.—A second group of cases in which electricity works almost incredible wonders is rheumatoid arthritis. This affection is usually considered incurable. During the past few years some thirty cases have been under treatment at the Post-Graduate Medical School and Hospital. Many of them have been cured, and in all of them the progress of the disease has been arrested. There is present this evening one of the most satisfactory cases, a private patient who, after having been under electrical treatment in France, was told that it was possible for her to receive the same sort of electrical treatment at home, and was referred to him. She had the swollen, stiff joints of the advanced preliminary stage of rheumatoid arthritis and was rapidly becoming absolutely helpless. She was not able to break bread in her fingers, and practically all of her joints were very stiff. As may be seen, three months of treatment has completely cured her, and she was able to dance at the last Assembly ball.